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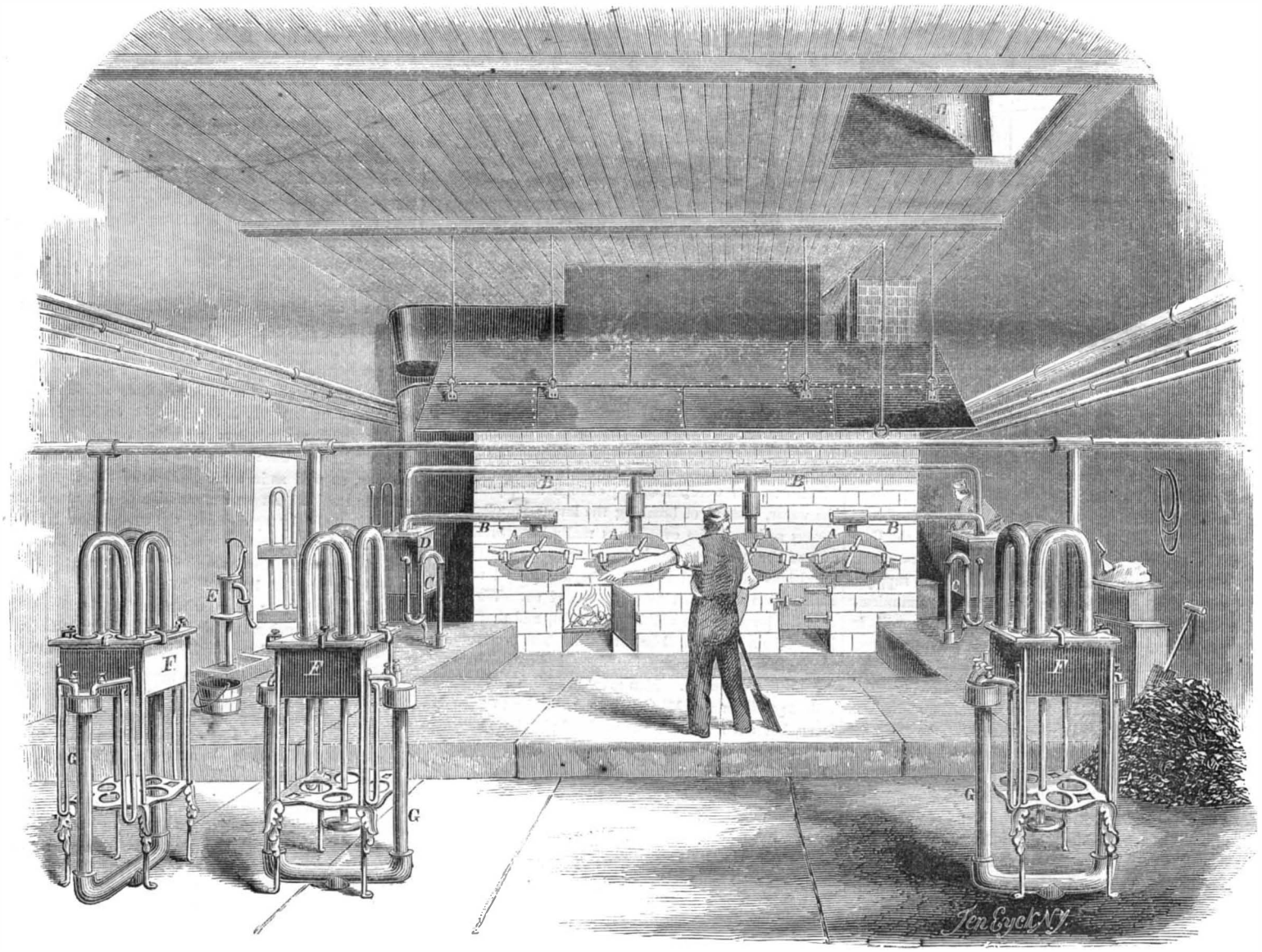
THE GAS-WORKS AT THE ST. DENIS HOTEL.

One of the first and most respectable hotels in this city—the St. Denis, corner Broadway and Eleventh-street—has recently adopted the method of making its own gas for illuminating purposes, and the gas-works are so complete and worthy of imitation at all such establishments, factories, villages, and small communities generally, that we have engraved views of them for the benefit of such places. As to the question of cost, the proprietor, Mr. P. Degive, informs us that since these works were erected and have been working, his gas has not cost over $1 per 1,000 cubic feet, and that, adding the interest of the first cost of the buildings, apparatus, &c., it will not come to more than one-half the price of gas if procured from city companies; besides which profit, he heats all the water required for his large establishment with the waste heat from the retort furnaces or fires. The common complaint against small gas-works, close to the building in which the product is to be consumed, is, that the odor that is given off from the escape of gas at the charging and clearing the retorts is offensive and unhealthy. This may be so in some places, but it does not hold good in the St. Denis gas-works, where a large hood extends the whole length of the stack of retorts, and being connected with a chimney, carries off all odor far above the highest building; and so well does it do this that, on one occasion on which a retort was opened in our presence, we, standing out of the limits of the hood, though in the gas-house, could smell no more gas than if we had been a mile from such place. Fig. 1, which is an interior view of the gas-house, shows the arrangement of the retorts and condensers. The retorts, A, are so arranged that there are two to each fire, and the cokes which come out of them after the gas has been made serves as fuel to the fires, and as there is an excess it also helps the kitchen fire. The gas is led from the retorts through pipes, B, in the two tar-boxes, D, where it meets with water, and here a certain quantity of tar is removed from the gas and passes, by the siphons, C, which keep the tar out of sight and smell, to the tar well underneath the floor, from which, when too much has accumulated, it can be removed by the tar-pump, E, and applied to some useful purpose. The gas then passes to the condensers, F, of which there are as many as there are retorts (three only being seen in our view), and in these all tarry and ammoniacal vapors are condensed, and the gas cooled by a constant stream of water, the waste products being carried, by the waste water, which is always running, through the pipes, G, into the sewer, so that they can give off no offensive odor. The gas is now carried to the purifiers, which are in a separate room seen to the left of the picture through the door, but seen in detail in Fig. 2. I I′ are the two purifiers, and J is the barrel containing the purifying liquid, which is a chemical solution. These purifiers are filled so that only one works at a time, and the man can clean one while the other is working, so that one of them is always clean.



THE GAS-WORKS AT THE ST. DENIS HOTEL, NEW YORK.

The only cleaning that is required is the opening of one faucet, and the purifiers clean themselves. One great novelty of these works is, that they are perfectly safe, and cannot explode from excessive pressure or other cause, as each retort is provided with a safety-valve that is the special subject of one of the inventor's patents, and it is so arranged that the moment the pressure becomes too high the valve is raised and the gas escapes up the chimney, which is immediately perceived by the attendant. In fact, the great beauty of these gas-works is, that the laborer has only to turn on a faucet to clean any part of the apparatus, and although 500

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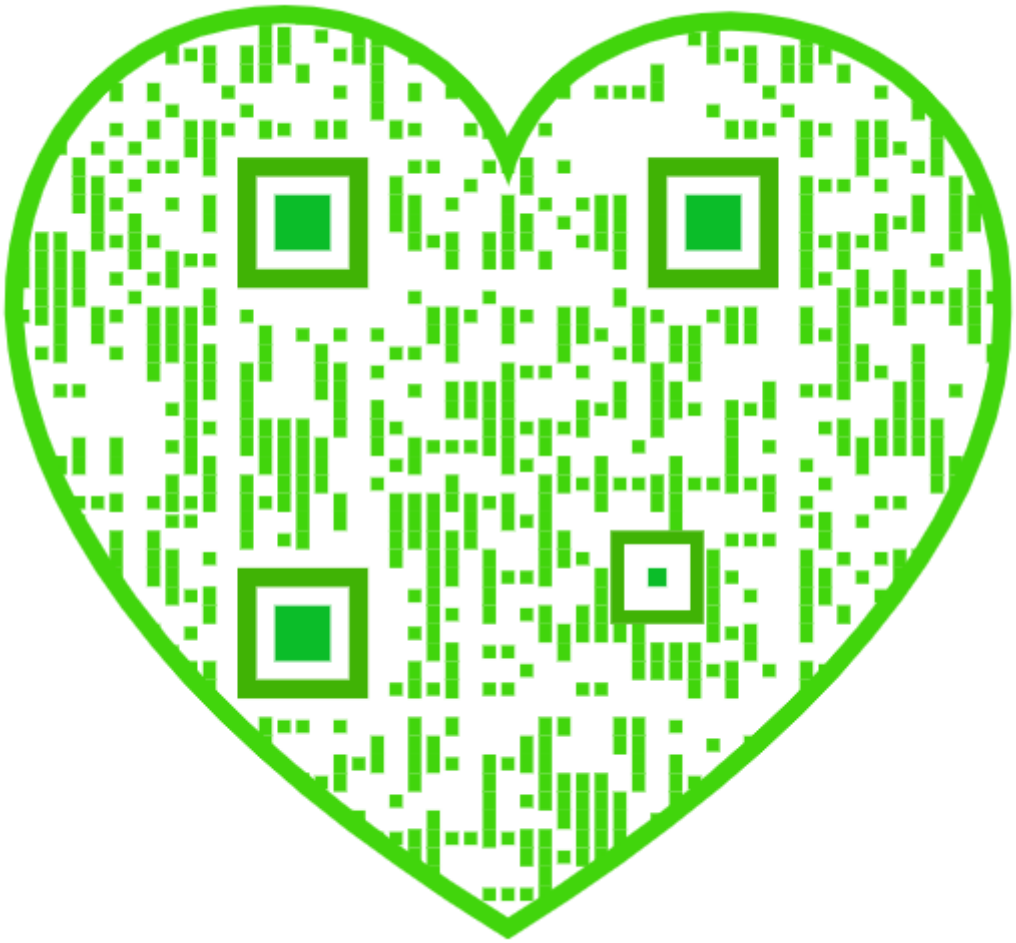
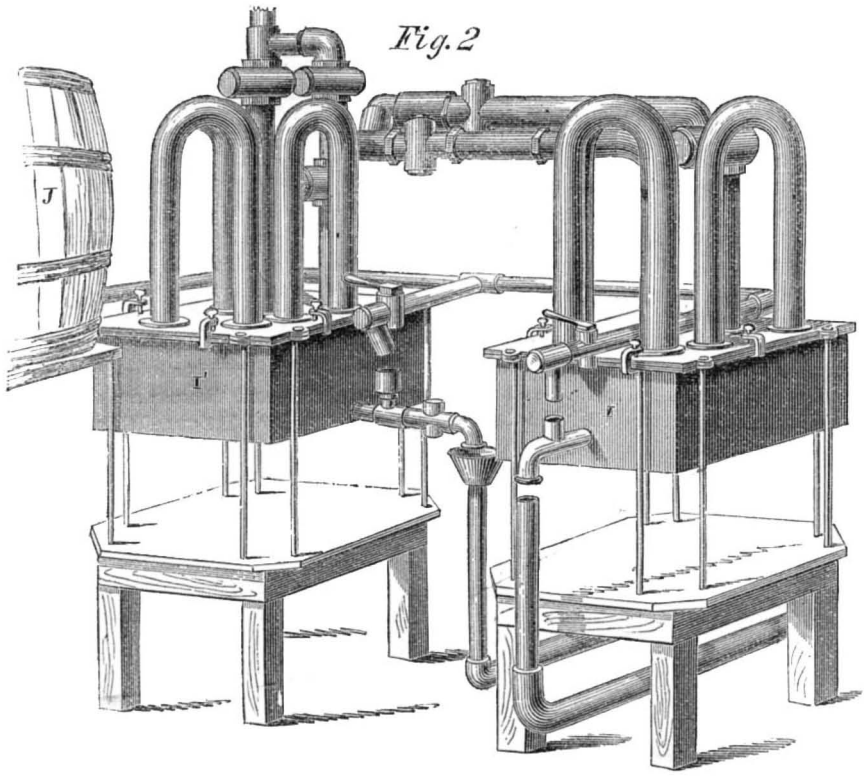


lights are supplied nightly, it takes but one man half his time to attend to making the gas, which is of an excellent quality, giving a good, clear and steady light. The gasometer, H, is a dry one, being placed over the works, and it is made of half iron plate, the rest being vulcanized india-rubber, the rubber being on top and raising or lowering as the gas is forced in or is let out to supply the burners. The whole works occupy a space of

Fig. 2



only 18 by 20 feet, and are placed in a corner of the hotel yard. All the parts are durable and well made, and we have no doubt they will repay the proprietor for his good judgment in erecting this apparatus.

The inventors are the Messrs. Hendrickx Brothers, and the builders are the Gas Generating Company, of No. 512 Broadway, New York. We illustrated another arrangement of theirs on page 97, Vol. XIV., SCIENTIFIC AMERICAN, since which they have extended their operations considerably, and now fit up much larger but equally successful works. Every one who is interested in having gas in his premises at a cheap rate (and who is not?) should call at the St. Denis Hotel, or at the German Club-house, Nos. 104 and 106 Fourth-avenue, where a smaller apparatus, just as good, but to supply a less number of burners, is at work; or communicate with the company at their address, and they will be happy to give any information that we may have omitted.

MARVELS OF THE MISSISSIPPI.

We extract the following interesting information from the Memphis (Tenn.) *Avalanche*, regarding the "Father of Waters" and the valley through which it rolls its mighty flood :—

"The difference of level between high and low water-mark at Cairo is 50 feet. The width and depth of the river from Cairo and Memphis to New Orleans is not materially increased, yet immense additions are made to the quantity of the water in the channel by large streams from both the eastern and western sides of the Mississippi. The question naturally arises, what becomes of this vast added volume of water? It certainly never reaches New Orleans, and as certainly does not evaporate; and, of course, it is not confined to the channel of the river, for it would rise far above the entire region south of us.

If a well is sunk anywhere in the Arkansas bottom, water is found as soon as the water-level of the Mississippi is reached. When the Mississippi goes down, the water sinks accordingly in the well. The owner of a saw-mill, some 20 miles from the Mississippi, in Arkansas, dug a well to supply the boilers of his engine during the late flood. When the waters receded his well went down, until his hose would no longer reach the water, and finally his well was dry. He dug a ditch to an adjacent lake to let water into his well; the lake was drained, and the well was dry again, having literally drank 10 acres of water in less than a week. The inference is, that the whole valley of the Mississippi, from its banks to the highlands, on either side, rests on a porous substratum, which absorbs the redundant waters, and thus prevents that degree of accumulation which would long since have swept New Orleans into the Gulf but for this provision of nature, to which alone her safety is attributable. In fact, if the alluvial bottoms of the Mississippi were like the shores of the Ohio, the vast plain from Cairo to New Orleans would to-day be part and parcel of the Gulf of Mexico, and the whole valley a fresh-water arm of the sea. Were the geological character of the valley different, the construction of levees, confining the waters of the Mississippi to its channel, would cause the rise in the river to become so great at the South that sufficient levees could not be built. The current would be stronger, and the accumulation of water greater, as the levees were extended north of us.

Such results were reasonably enough anticipated; but the water, instead of breaking the levees, permeates the porous soil, and the overflow is really beneath the surface of the swamps. Such, it seems to us, are the wise provisions of natural laws for the safety and ultimate reclamation of the rich country south of us. We believe that the levee system will be successful, and that the object of its adoption will be attained. The porousness of the materials used in making them has caused most, if not all the crevasses. Men may deem it a superhuman task to wall in the Mississippi from Cairo to New Orleans, but our levees are the work of pigmies when contrasted with the dykes of Holland. The flood-tide of the Mississippi is but a ripple on the surface of a glassy pool compared with the ocean billows that dash against the artificial shores of Holland. The country to be reclaimed by our levees—all of which will not for fifty years cost the people as much as those of the Dutch when originally built—would make a hundred of such kingdoms as that over which a Buonaparte once wielded the sceptre."

THE VELOCITY OF LIGHT.—The velocity with which light travels is so inconceivable that we require to make it intelligible by some illustrations. It moves from the sun to the earth in seven and a half minutes; whereas, a cannon-ball fired from the earth would require 17 years to reach the sun. Light moves through a space equal to the circumference of the earth, or about 25,000 miles, in about the eighth part of a second. The swiftest bird would require three weeks to perform this journey. Light would demonstrably require five years to move from the nearest fixed star to the earth and probably many thousand years from the most remote star seen by the telescope. Hence, if a remote visible star had been created at the time of the creation of man, it may not yet have become visible to our system.—*Encyclopædia Britannica.*

MOTHER-OF-PEARL.

A peculiar phenomena is noticed when wax, stearine, or a similar substance, especially if colored black by lamp-black or graphite, has been poured on a sheet of mother-of-pearl. It is that the inner surface of the congealed substance, in a certain position to the eye, appears with the same bright iridescence as the plate itself. This goes to prove that those colors are not owing to a particularity of the substance of mother-of-pearl, but solely to the condition of its surface, which consists of fine striæ that bend the rays of reflected light and resolve them into the various colors. Its being reflected light is proved by the complete disappearance of the variegated colors when the surface is exposed to homogeneous light, such as that from a lamp fed with alcohol containing chloride of sodium. Liquid wax or stearine poured on the surface will receive an impression of even the finest unevenness, only discernable with the glass, and therefore also striæ causing the iridescence. That the surface of mother-of-pearl gives this opalescence in a number of positions to the eye, and that obtained on wax only when held in a certain direction, is caused by the many laminæ underlying each other in the original, as remarked by Breithaupt. Seen through a Nicol's prism (of course, with homogeneous light), in case the undulating prisma falls vertically upon that of the reflected rays, the surface of the wax impression appears dark, while that of the original will still be bright; for, although the plane of prisma be vertical to that of the rays proceeding from the surface, it intersects those from the underlying laminæ under a different angle.

CIGAR-MAKING MACHINE.

We have recently examined a most ingenious machine, the invention of M. Louis Beauche of Paris, for making cigars. The machine is in two parts, one for rolling the filler (the *bunch*), and the other for putting on the wrapper; the last by the peculiar shape of the rollers forms the rounded end of the cigar (the *head*) which is put in the mouth, and the cigar is as easy to smoke and as nice in shape as any hand-made one. The wrappers are cut from a pile (*book*) of leaves to the proper shape by a novel cutting machine, and a great number can be cut at once. The motions of the hand are perfectly imitated, and the softness and elasticity of that member, which render it capable of such work, is obtained by endless bands of rubber moving over rollers and which roll the cigar into shape. Patents have been taken out in Europe and this country, as well as in some portions of South America and the tropics. At an examination of this machine at Madrid, made by royal order, the commission reported that it made 42 cigars in ten minutes, or 252 in one hour, and this was manifestly so great a saving that it would have been adopted by the Spanish government if that body had had other means of employing the number of persons which such a machine would throw out of employment, but it will eventually be adopted in Spain.

To show the value of such an invention to this country we may state that in New York city alone, there are about 200,000 smokers, each using two cigars per diem, which makes 400,000 cigars every day. These will cost for labor alone, at $6 per thousand, the enormous sum of $8,760,000 annually, when made by hand, and the inventor calculates that his machine, which can be attended to by women and children, will produce them for $1 per thousand, making the total cost for a year to the smokers of this city for labor, only $1,460,000, or one-sixth the present amount. This is an enormous saving, and deserves the attention of all who are interested in this branch of manufacture. From other States than our own we import annually, into this city alone, 12,000,000 pounds of tobacco, which is thus distributed:—Connecticut, 10,000 cases of 400 pounds each; Pennsylvania, 6,000 cases of 400 pounds each; Ohio, 10,000 cases of 370 pounds each. From New York we receive 5,000 cases of 400 pounds each; we also import 6,000,000 pounds from Havana, and a quantity from other Spanish ports, and as we are told that on the average 20 pounds of tobacco are required for every 1,000 cigars, we can easily calculate that there are 900,000,000 cigars made in this city alone in one year.

As we shall publish an engraving of this machine at some future time, a full description is unnecessary at present, and we conclude by calling attention to the invitation of M. Beauche in our advertising columns.

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EARLY HISTORY OF SAW-MILLS.

In early periods, the trunks of trees were split with wedges into as many and as thin pieces as possible, and if it was necessary to have them still thinner, they were hewn on both sides to the proper size. This simple and wasteful manner of making boards has still been continued in Russia to the present time. Peter the Great tried to put a stop to it by forbiding hewn boards to be transported on the river Neva. The saw, however, though so convenient and beneficial, has not been able entirely to banish entirely the practice of splitting timber used in roofing, or in making furniture and utensils; and, indeed, it must be allowed that this method is attended with peculiar advantages, which that of sawing never can possess. The wood-splitters perform their work more expeditiously than sawyers, and split timber is much stronger than that which has been sawn; for the fissure follows the grain of the wood, and leaves it whole; whereas, the saw proceeding in the line chalked out for it, divides the fibers, and by these means lessens its cohesion and solidity. Split timber, indeed, often turns out crooked and warped; but in many purposes to which it is applied, this is not prejudical, and such faults may sometimes be amended. As the fibers, however retain their natural strength and direction, thin boards particularly can be bent much better. This is a great advansage in making pipe-staves, or sieve-frames, which require still more art, and in forming various implements of the like kind.

Our common saw, which needs only to be guided by the hand of the workman, however simple it may be, was not know to the inhabitants of America when they were subdued by the Europeans.

The saws of the Grecian carpenters had the same form, and were made in the like ingenious manner as ours are at present. This is fully shown by a painting still preserved among the antiquities of Herculaneum. Two genii are represented at the end of a bench, which consists of a long table that rests upon two four-footed stools. The piece of wood which has to be sawn through is secured by cramps. The saw with which the genii are at work has a perfect resemblance to our frame saw. It consists of a square frame, having in the middle a blade, the teeth of which stand perpendicular to the plane of the frame. The piece of wood which is to be sawn extends beyond the end of the bench, and one of the workmen appears standing and the other sitting on the ground. The arms, in which the blade is fastened, have the same form as that given to them at present. In the bench are seen holes, in which the cramps that hold the timber are stuck. They are shaped like the figure 7, and the ends of them reach below the boards that form the top of it. The French call a cramp of this kind *un valet*.

The most beneficial and ingenious improvement of this instrument was, without doubt, the invention of saw-mills, which are driven either by water, wind, or by steam. Mills of the first kind were erected as early as the fourth century, in Germany on the small river Roer, or Ruer; for though Ausonius speaks properly of water-mills for cutting stone, and not timber, it cannot be doubted that these were invented later than mills for manufacturing boards, or that both kinds were erected at the same time. The art, however of cutting marble with a saw is very old. Pliny conjectures that it was invented in Caria; at least, he knew no building incrusted with marble of greater antiquity than the palace of King Mausolus, at Halicarnassus. This edifice is celebrated by Vitruvius for the beauty of its marble, and Pliny gives an account of the different kinds of sand used for cutting it; for it is the sand properly, says he, and not the saw, which produces this effect. The latter presses down the former, and rubs it against the marble, and the coarser the sand is, the longer will be the time required to polish the marble which has been cut by it. Stones of the soap-rock kind, which are indeed softer than marble, and which would require less force than wood, were sawn at that period; but it appears that the far harder glassy kinds of stone were sawn then also, for we are told of the discovery of a building which was encrusted with cut agate, cornelian, lapislazuli, and amethysts. There is, however, found no account in any of the Greek or Roman writers of a mill for sawing wood, and as the writers of modern times speak of saw-mills as new and uncommon, it would seem that the oldest construction of them has been forgotten, or that some improvement has made them appear entirely new.

When the Infant Henry sent settlers to the island of Madeira, which was discovered in 1420, and caused European fruits of every kind to be carried thither, he ordered saw-mills to be erected also, for the purpose of sawing into boards, the various species of excellent timber with which the island abounded, and which were afterwards transported to Portugal. About the year 1427 the city of Breslau had a saw-mill, which produced a yearly rent of three marks, and in 1490 the magistrates of Erfurt purchased a forest, in which they caused a saw-mill to be erected, and they rented another mill in the neighborhood besides. Norway, which is covered with forests, had the first saw-mill about the year 1530. This mood of manufacturing timber was called the new art; and because the exportation of boards was by these means increased, that circumstance gave occasion to the deal tythe, introduced by Christian III. in the year 1545. Soon after, the celebrated Henry Ranzau caused the first mill of this kind to be built in Holstein. In 1552 there was a saw-mill at Joachimsthal, which as we are told, belonged to Jacob Geusen, mathematician. In the year 1555 the Bishop of Ely, ambassador from Queen Mary of England to the court of Rome, having seen a saw-mill in the neighborhood of Lyons, the writer of his travels thought it worthy of a particular description. In the sixteenth century, however, there were mills with different saw-blades, by which a plank could be cut into several boards at the came time. Pighius saw one of these, in 1575, on the Danube, near Ratisbon, when he accompanied Charles, prince of Juliers and Cleves, on his travels. It may here be asked whether the Dutch had such mills first, as is commonly believed. The first saw-mill was erected in Holland at Saardam, in the year 1596, and the invention of it is ascribed to Cornelius Cornelissen, but he is as little the inventor as the mathematician of Joachimsthal. Perhaps he was the first person who built a saw-mill at that place, which is a village of great trade, and has still a great many saw-mills, though the number of them is becoming daily less, for within the last thirty years a hundred have been given up. The first mill of this kind in Sweden was erected in the year 1653.

In England saw-mills had at first the same fate that printing had in Turkey. When attempts were made to introduce them, they were violently opposed, because it was apprehended that the sawyers would be deprived by them of their means of getting a subsistence. For this reason it was found necessary to abandon a saw-mill erected by a Dutchman near London, in 1663; and in the year 1700, when one Houghton laid before the nation the advantages of such a mill, he expressed his apprehension that it might excite the rage of the populace. What he dreaded was actually the case in 1767 or 1768, when an opulent timber merchant, by the desire and approbation of the Society of Arts, caused a saw-mill, driven by the wind, to be erected at Limehouse, under the direction of James Stansfield, who had learned in Holland and Norway the art of constructing and managing machines of that kind. A mob assembled and pulled the mill to pieces, but the damage was made good by the nation, and some of the rioters were punished. A new mill was afterwards erected, which was suffered to work without molestation, and which gave occasion to the erection of others. It appears, however, that this was not the only mill of the kind then in Great Britain, for one driven also by wind had been built at Leith, in Scotland, some years before.

The application of the steam-engine has in modern times almost entirely displaced the use of either water or wind as the source of power in machinery, in England, as most of the saw-mills now in action, especially those on a large scale, are worked by steam.—*Beckmann's History.*

DYEING A PURPLE WITH MUREXID.

The objections which lately have been raised as to the instability of the murexid dyes are said to be avoided by the process recently communicated by Mr. Wurtz, of Leipsic, to the *Deutsche Muster-Zeitung*. According to him, the pieces or woolen stuffs are very carefully cleaned in a strong soda-bath, and then in a soap-liquor. This complete cleansing is indispensable in order to obtain a fine hue. The soda solution should not, of course, be so strong as to effect the animal fiber; though both the soda and soap-liquor should be as concentrated as practicable. When the pieces have been thoroughly rinsed and and drained, they are placed in the following dye-bath:—To 12 lbs. of wool, add 350 lbs. of lukewarm water, (100° Fahr.) ¼ lb. murexid in powder, and 51 lbs. niter of lead. The murexid being mixed and dissolved in part of the water, the rest of this is added. Then the niter of lead previously dissolved in 30 to 35 lbs. of boiling water is poured in, and lastly the wool added. The dye-bath, is allowed to cool, the wool remaining in it for about 20 hours, after which it is taken out, slightly washed, and placed into the following fixing and reviving bath: 400 lbs. of cold water, 1 lb. of corrosive sublimate, and 3 lbs. of acetate of soda. Here it remains from five to seven hours, according as a more or less blue tinge is desired. After one dyeing a new operation may be commenced with the same liquors by adding ¾ of the same quantum of dyestuffs. The color thus obtained is stated to be far superior to that with cochineal. The quality and purity of the murexid is of great importance in this process, but the method, according to the opinion of practical men, is the best in use.

We have in former volumes given some practical information on murexid colors, part of which was obtained from German dyers in this city, and part was translated from German publications. Thus far, murexid colors have not superseded those obtained from cochineal, and we think they never will, unless some substitute is discovered for the use of corrosive sublimate, which seems to be required for "raising the bloom," because colors so produced are liable to fade rapidly when exposed to the rays of the sun. We present the above in order to afford a subject for further experiment in praetical chemistry.

A REMARKABLE SOLVENT.

It is now discovered, it appears, that if a piece of copper be dissolved in ammonia a solvent will be obtained, not only for lignine, the most important principle of all woody fiber, such as cotton, flax, paper, &c., but also for substances derived from the animal kingdom, such as wool and silk. By the solution of any one of these, an excellent cement and water-proofer is said to be formed; and, what is equally important, if cotton fabrics be saturated with the solution of wool, they will be enabled to to take dyes, such as the lac dye and cochineal, hitherto suited to woolen goods only. Hydriodide of ammonia, we may also observe, was not long since discovered to be an equally remarkable solvent, or, at least, insoluble, mineral substances. Now, it is an interesting circumstance that ammonia, according to Von Helmont and other old chemists and alchemists, was one of the requisite materials in the formation of the "alkahest," or "universal solvent," of the ancient sages! In the cupride of ammonium (if we may so call the solvent here first spoken of) we seem to have the solvent of silk which we have lately desiderated in our remarks on the insulation of submarine telegraph wires. — *London Builder.*

SPIRAL DRIVING NAILS AND BOLTS.—A patent has been got up by Mr. Montague Wigzel, of Exeter, for an invention, which he calls the "patent improved twisted or spiral fluted driving articles." Nails made on this principle prevent starting, and are said to be readily driven or twisted out, and they require no hole to be previously made. The idea seems to be a decidedly good one. The driving of such fluted nails and bolts into wood reminds one of the way in which the Armstrong bolts are driven through the rifled interior of the cannon, only in this case the rotation of the bolt is effected by the fluting of the bolt itself, and not by any rifling of holes in the wood.

[The above has been copied into several of our cotemporaries from foreign journals, and we must say that if there is any merit in the invention of this self-driving spiral bolt, we claim it for an American inventor, a native of Boston, whose name we forget, but who sent such a bolt to us at least ten or eleven years ago, and it was in our possession for three or four months before we returned it.—EDS.

FIRE-PROOF CLOTHING.—A writer in the *Polytechnic Notizblatt* proposes phosphate of ammonia as a most excellent substance for rendering garments as nearly fireproof as can be desired, and much superior even to liquid glass. A mixture of phosphate of ammonia and sal ammoniac has long been in use, under the name of "Gay Lussac's Preventive."

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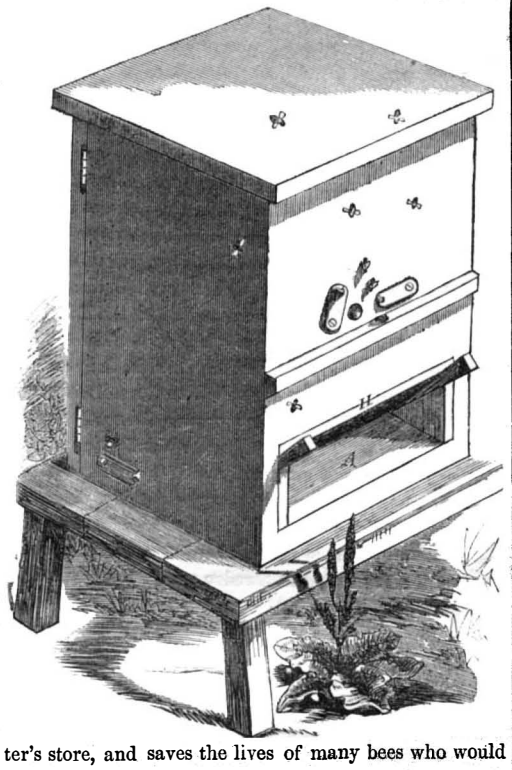
ENGLISH CHAIN CABLES.

The great quantity of bad English chain cables which have been thrown into the market by atrociously dishonest merchants has called forth a circular from the operative chain-makers (the working mechanics) of England, Scotland and Wales, to the directors of marine insurance associations, merchants, ship-owners, and others concerned in shipping, in which they point out the defective character of many of the cables in use, and the dishonest practices of ironmongers who deal in cables and other chains employed on shipboard. We cannot forbear quoting most of this circular, because "it bears such an honest countenance." These mechanics say:—"As practical workmen, daily occupied in the manufacture of chains, we have been made painfully aware, during the past few years, of the great increase in the manufacture of inferior cable and topsail sheet chains in many parts of the kingdom; thus proving that their use is not alone confined to the fitting-out of vessels in England, but that large quantities are also exported to all the principal shipping harbors in the world. The consequence is, that ships constructed with all the improvements that mechanical science can devise, and laden with valuable cargoes, are often totally lost from the insufficiency and inferiority of their cables and other chains. Men's lives are sacrificed, merchants sustain severe losses, marine insurance societies have their profits diminished, and a portion of the wealth of the nation is annually destroyed by the continued use of bad chains. This evil has of late so much increased that it is gradually becoming more difficult for the honest manufacturer, who employs first-rate workmen, and uses a good quality of iron in the manufacture of his chains, to bear up against the unprincipled trader, who supplies a valueless article at cheaper rates and upon false representations. It is not at all an uncommon practice for dealers in chain to give certificates to the buyer to the effect that the article supplied has been properly proved, when, in reality, though it has gone through the machine, yet the proper weight has not been put upon it. In many chain works, where the buyer is determined that the chain purchased shall bear Admiralty weight, an additional sum beyond the regular price is paid to the workman; thus proving that it is an uncommon practice for them to prove their chain according to Admiralty weight. From inquiries recently made at the Liverpool public test, it was ascertained that a short time ago, some captains (who during the voyages had lost their anchors), with a view to know whether their cables were reliable or not, brought them to the machine, when they broke to pieces with several tuns less weight than they ought to have borne. In some chain works a certain description, named by the workmen 'boiler chain,' is made in large quantities, the agreement between the employer and workmen being, that it is neither to be examined nor proved, but taken from the 'block' of the workman direct to the 'boiler,' where it is coated with tar, and sent into the market utterly valueless for any purpose for which chain ought to be used. Instead of receiving assurances upon trust, merchants should be thoroughly satisfied that the chains which they purchase are proved in a proper manner, as not one-half of those represented to be so really are, and marine insurance societies should decidedly refuse to insure either ships or cargoes, without the owner of the vessel can produce a proper certificate that his chains have been properly proved. For the greater security of shipping property, it has become an absolute necessity that in all large ports a public test should be erected, and a duly qualified inspector appointed to take charge of the machines. We have been emboldened to send these circulars to those interested in the matter in every large shipping port in the kingdom, and also to the principal harbors abroad, because we are firmly convinced, from our practical knowledge, that if such steps as we have suggested be acted upon, they would be found very materially to diminish casualties at sea."

As most of the cables employed in our shipping are obtained from England, this circular should at once arrest the attention of our marine merchants, and especially the Board of Underwriters in this city. We have no doubt but that many an American ship has been driven on a lee shore and wrecked owing to the parting of her miserable cables. Those cables for American shipping should all be manufactured at home, of the best American iron, and should be submitted to an inspector's test before they are allowed to be sold. When it is considered that so many valuable lives and so much valuable property are frequently suspended upon the simple chain which holds a ship at anchor, surely there ought to be no uncertainty regarding the strength of the iron thread upon which hang the issue of life or death. Those mercenary wretches of merchants, alluded to in the above circular, are not fit to dwell among and deal with their fellow-men. In a moral sense, they have been guilty of the highest crimes against man and society, and justly deserve to be banished from the abodes of civilization.

HARBISON'S IMPROVED BEE-HIVE.

By the peculiar arrangement of this hive, air, without light, is admitted into the hive, so that the bees are well supplied with the necessary material for respiration; and by being kept in the dark, they are continually in repose, and require less food for their sustenance than if they were in a state of activity. This economizes their win-



ter's store, and saves the lives of many bees who would otherwise die of starvation, and prevents the ravages of the neighboring bees. Fig. 1, in our illustrations, is a perspective view, and Fig. 2 a section of this hive; and by reference to them the construction will be understood.

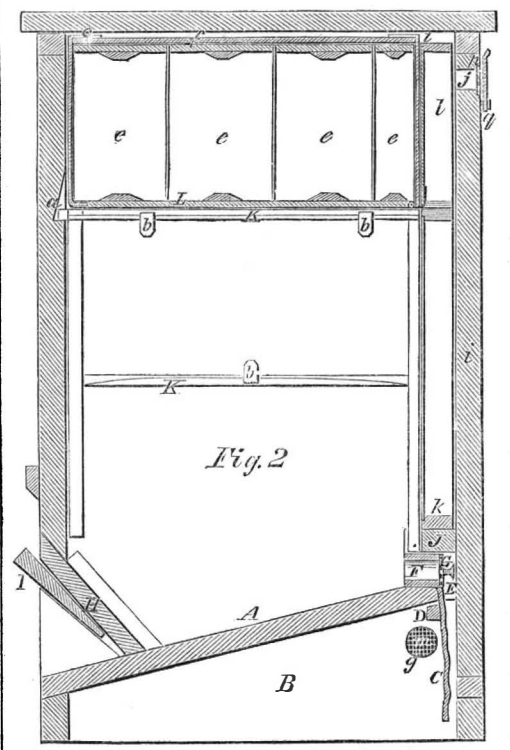


Fig. 2

A is the inclined bottom-board of the fifth chamber. It is elevated above the bottom of the hive, so as to form a chamber, by means of which the admission of air and light is graduated according to the requirements of the bees at different seasons of the year.

B is the graduating chamber for the admission of air and light into the hive. C is a curtain, which can be raised to admit more or less light, as may be required, and, when lowered, serves for throwing a shade about the air-space, thereby preventing the entrance of light into the working-chamber, without interfering with the ventilation of the same, and which serves to keep the bees in a state of repose a greater part of the time when unable to collect honey, or during windy and cold weather at any season. D is the cross-piece to which the curtain is attached. It is secured to the inclined bottom-board, A, at such a distance from the door as to allow a space for the admission of air and light to the hive. E is the passage for the admission of air and light to the hive, and F is a movable cross-piece, provided with two wire screens, G, for the purpose of admitting the air and light, which ascend through the passage, E. H is an adjustable slide, which fits loosely in grooves on the sides of the hive, and provided with a wedge, I, for the purpose of tightening or loosening the same, said slide, H, being removed to admit the discharge of any impurities which may have collected on the inclined bottom-board, A. J is a cross-piece, mortised to admit the lower ends of the sectional comb-frames, K, which has a tenon cut on its lower end, and which fits into the mortise cut in the cross-piece, J, and also has a projection on its upper part which fits into a slot, *a*, cut on the inner part of the front of the hive; by this means it is secured in its right position in the hive, the lower part of the sectional comb-frame, K, being adjustable up and down, by means of holes and pins, for adjusting it to the different-sized combs. By removing the honey-boxes, and bearing on the upper part of the sectional comb-frame, K, it can be elevated out of the slot, *a*, and the apiarian is thus enabled to remove or replace it with ease and facility without molesting the other bees, or in any way injuring the combs in the adjoining frames.

The sectional comb-frame, K, is provided with six or more flexible metal clamps, *b b*, secured to its upper and lower ends, which serve to retain the comb in the sectional comb-frame; and by raising the flexible metal clamps, *b b*, on one side of the frame, the apiarian can remove or replace a comb with facility and despatch.

L is the platform supporting the honey-boxes, and resting on the tops of the sectional comb-frames, K, of such a width as to allow a passage for the bees to the honey-box. The platform, L, is provided with a flexible back-angular clamp, and a flexible front-angular hinged clamp, both of which serve to brace the honey-boxes; *e e e* are the honey-boxes resting on the platform, L; *f* is the upper coupling-strap, fitting under the angles of the flexible angular-clamps, which completes the bracing of the honey-boxes.

By removing the coupling-strap, *f*, and folding down the flexible angular hinged clamps on L, the honey-boxes may be removed separately; and, by folding the flexible angular hinged clamp to its former position, and replacing the coupling-strap, *f*, the honey-boxes may all be removed at once, thus affording great ease and facility for reaching the sectional comb-frames, K; *g* are apertures provided with wire screens, *m*, and movable covers, for the admission of air and light to the graduating chamber, B. There are openings provided with movable covers for the ingress and egress of the bees; *i* is the door of the hive, provided with an opening, *j*, which is furnished with a wire screen, *p*, and movable cover, *q*, that serves to admit air and light to the upper part of the hive. K is a glass frame, resting on the cross-piece, J, and inclosing the sectional comb-frame, K, and *l* is a glass frame resting on the glass frame, *k*, and inclosing the honey-boxes, *e e e*.

This is a very useful invention to all apiarians, and the inventor is John S. Harbison, of Sacramento, Cal., where he can be addressed for further information. The patent is dated Jan. 4, 1859.

STRAWBERRIES.—A correspondent in the *Cincinnatus* informs the editor that "Peabody's New Hautbois Strawberry" is a failure as regards the fruit. The plant is hardy and stands an Indiana winter well, but although the plants blossomed freely, the fruit never swelled, "not one in a hundred making a berry of any size." The editor confirms this on reports from cultivators and nurserymen all over Ohio, and recommends many other varieties as superior, especially the "Longworth Prolific," and "McAvoy Superior." As we have many subscribers who no doubt have good strawberry beds, this information will be interesting to them.

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THE FORM OF BOILER-HEADS.

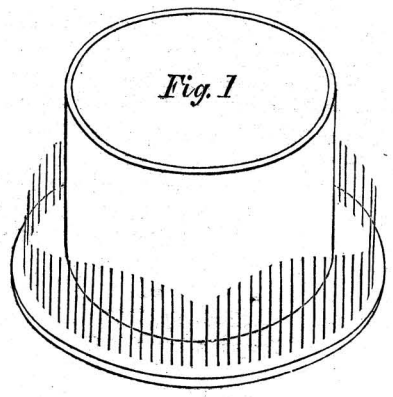
As an introduction to this very important subject, nothing requires to be prefixed by us to the following letter:

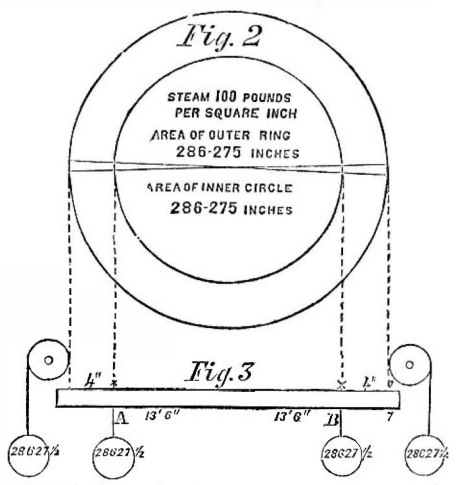
MESSRS. EDITORS:—The explosion of the drum-head of the steamboat *Falls City*, which occurred April 14, 1858, on the Mississippi river, gave rise to the accompanying correspondence between two mechanics as to what is the proper form for boiler-heads of cast-iron. You will perceive by the diagrams that both parties feel confident of the strength of their position.

JOHN ROY.

Mr. M——,

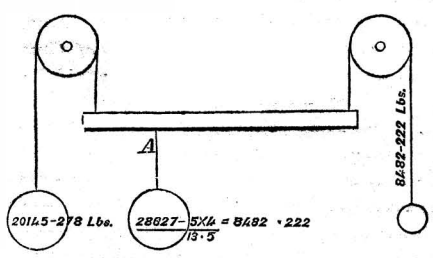
In our conversation yesterday you remarked that cylinder-heads stood better when hollowed out towards the center than if the edge thickness were carried straight across the whole head. The impression left on my mind was that if such were the case in steam cylinders, the same might be expected on the heads of steam boilers. As you will see by the inclosed sketch, I have been trying to account for this greater strength with a reduced quantity of metal, and I must confess that I have been unable to find it. Should your time permit you to examine these



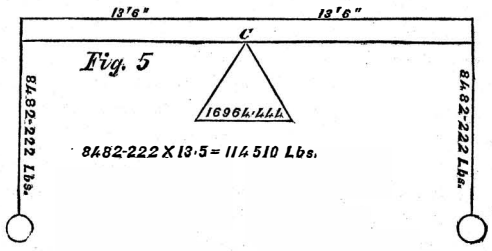


figures, I think you will find the strain at the center equal to the greatest strain, and that around the edges the least, with the greatest quantity of metal to sustain it.

If we look upon Fig. 1 as representing a circular plate of iron, 27 inches in dimeter, with an area of 572.55 inches, loaded with a weight of 100 pounds upon every square inch of its surface, this will be equal to 57,255 pounds. Now, supposing the upright cylinder to weigh



this amount, I will call the diameter 19 inches, and the vertical lines points of support for the 27 inch diameter plate. I look upon this weight as an equivalent for the steam acting upon the end of a steam boiler, for if the area be divided equally by a circle, the diameter of that circle will be about 19 inches, as at Fig. 2, and the weight on the outside is equal to the weight on the inside of the circle, and may be considered as a beam, Fig. 3, with half the weight suspended at A, and the other half at B. It will be very evident that A or B will act with a lever-age of 4 inches and consequently with four times the force of themselves, 28627·5×4=114510 pounds, and this is the maximum strain upon the metal, and this strain is continued to the center, for although the lever-age is increased the pressure is diminished in the same ratio; for if I consider the weight to be acting on a bracket, as in Fig. 4, instead of a beam, the same result would follow, for 28627·5×4÷13·5=8482·222 pounds necessary to support the bracket at the outer end from the weight acting at A, and the same from the weight at B,



equal to a weight of 16964·444 pounds placed at C, and acting as if the weight were placed under the beam, as at Fig. 5, for a fulcrum with half the weight suspended at each end. The metal at C would be strained to 8482·222×13·5=114510 pounds. This in my opinion would indicate an equal thickness for the materials at the center, and at A and B, and might be diminished towards the edges, just like the common beam. I know there are many mechanical advantages obtained by not following this theory, such as rounding the edges so as to take away all the sharp angles, &c. The *Falls City* blew the circle of greatest pressure out of her drum-head as neatly as if it had been punched, and I think that had it been of equal thickness throughout it would not have burst.

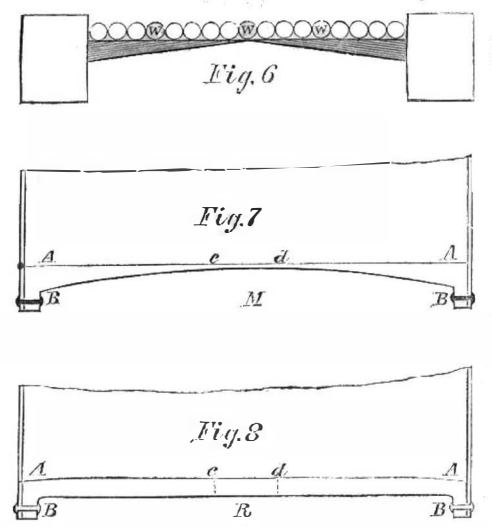
Should you see that I have erred in thus measuring the strains, be kind enough to correct them.

J. R.

New Orleans, May 9, 1859.

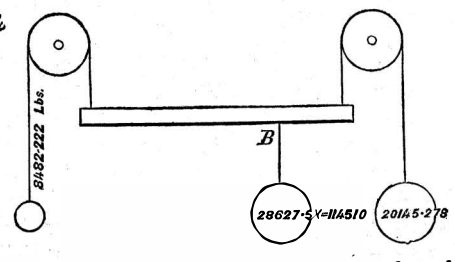
Mr. R——,

Your very interesting communication in regard to the subject matter of our conversation on Sunday last, was duly received, and would have been answered earlier, but for the conjoint influence of business, &c. I exam-



ined the diagrams and the text in elucidation of them, with some attention, but not with that attention which I would have given it, had I not observed that the whole

Fig. 4



of your reasoning was based upon an erroneous hypothesis, viz. illustrating your views by comparing a boiler-head to a beam. You have erred in comparing it to a beam resting upon each end and lying loosely, instead of comparing it to a beam whose ends are permanently fixed, with the weight or pressure equally distributed over its surface. The annexed rough sketch exhibits the correct form of a beam of *greatest strength* with *least material*, when the ends are *permanently fixed* and the *weight equally* distributed over its surface. The balls (*w*) are assumed to represent the weights distributed over the whole surface equally, and this is the precise form of a properly-constructed boiler or cylinder-head—which is an infinite number of beams fastened at their extremities and converging to a center. The correctness of my views appears so evident either with or without the foregoing demonstration that I might rest my case here, being assured that your unassisted reflection will inevitably lead you to the same conclusion; but elucidating the matter still further I annex a sketch of the general form of boiler-head I deem the best, and that which you approve of. Assuming that they are of equal diameters and of the same thickness at A B, let the diameters be 27 inches, area 572·55, pressure 100 pounds per square inch. Then the pressure upon the whole surface of each resisted equally by the thickness of metal at A B, will be 57255 pounds. Assuming a circle of 10 inches from *c*, to *d*, in the center of each head, what is the pressure which the thickness of iron at those points resists? Area 78·54×100=7854 pounds. In my head this decreased pressure is prorerly sustained by a decreased thickness of metal, but in your's by an increased thickness, violating every correct rule in the proportioning of material to resist pressure.

A fracture in a boiler-head, assuming the material to be without imperfections, of which theory can take no cognizance, will be a circle; this is evident. Now I submit it to you, is it not preposterous that a circle, say of one inch diameter, sustaining a pressure of 78·54 pounds only, in the center of your head, requires say four inches thickness to retain it in its place, while the whole circle of 27 inches sustaining a pressure of 57255 pounds requires only a thickness of say 2 inches. Again, let us test our plans by the method of carrying them to an extreme. Thickening the edged of my head and reducing the center to $\frac{1}{8}$ of an inch, and reversing the operation in your's, thickening the center and reducing the edges to $\frac{1}{8}$, need I ask you what would be the result?

The head of the drum of the *Falls City*, if I understand you correctly, blew out close to the rivets or at the "circle of greatest pressure." This example conclusively demonstrates the inaccuracy of your theory, for it is evident that no amount of thickness added to the middle would have contributed in the slightest degree to strengthen the head, as the pressure and the weakest part would remain unaltered.

I feel confident that, when you have investigated the principles involved in our controversy, you will agree with me.

A. M.

New Orleans, May 11, 1859.

LAKE SUPERIOR IRON.—Several of our cotemporaries state that a gigantic company, with a capital of $1,000,000, and with prospects of no ordinary character, has recently been formed, under the title of the St. Mary's Canal Mineral Land Company, the object being to work lands covering a surface of 182,000 acres; and proved to be rich in iron-stone, from which the finest quality of iron ore may be produced, situated in the upper peninsula of the State of Michigan. It not unfrequently happens that where two metals of vastly different commercial value exist in the same locality, the poorer of the two is neglected to an unjustifiable degree; and from the fact of Lake Superior having proved itself to be so fabulously rich in metallic copper, the iron, which seems to abound to an almost equal extent, has received comparatively little consideration. Year by year, however, more iron is shipped from the locality, and already several prosperous companies are in active operation. The quantity of iron ore shipped from Lake Superior was, in 1855, 1,447 tuns; in 1856, 11,297; in 1857, 26,184; and in 1858, 31,035 tuns. The company in question has both copper and iron locations, and it is believed that from each a fair profit will be raised, so that from the whole a large remuneration may be expected.

TINNED LEAD PIPES.—At Nantes, in France, there is a manufactory where they tin lead pipes inside and out, by passing them through a bath of melted tin, from which they emerge completely covered with the latter metal, all the pores and cracks filled and proof against oxydation. This is not a new process but is the first application of it in France on a large scale. It was patented in this country, 20 years ago, by Mr. Ewbank, formerly Commissioner of Patents.

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

We continue this week our remarks on and extracts from the reported proceedings of the above association.

WISCONSIN POTASH KETTLES.

An important paper was read by Professor Charles Whittlesey, on "Drift Cavities," as the "Potash Kettles" of Wisconsin. Along the summit of the dividing ridge between the waters of Rock river and those of Lake Michigan, there are numberless crater-like depressions, which are called by the people "Potash Kettles." They are in the form of cavities sunk below the general surface 10, 15 and even 100 feet, their outline rudely circular, and their sides as steep as the earth will stand. They have been traced about 100 miles. The materials in which they have been found is coarse drift. They seldom contain water; boulders are found in and around them. While exploring the State in 1849 it occurred to the professor that these cavities cannot be explained by the usual and well-known examples of aqueous deposits. Terraces and oblong ridges of sand and gravel might be formed by currents and eddies acting on loose material; but these are depressions on an even surface. He stated that in the present state of knowledge it was difficult to account for all the phenomena of western drift, but to his mind the depressions in Wisconsin were most readily and satisfactorily explained on the theory that they were the result of glacial action.

[There are several depressions of the same character in various parts of New York, such as Oneida and Madison counties; some of them contain water, others are dry during summer.—EDS.

ICE WELLS.

Professor Hitchcock then read a paper on "The Ice Well at Brandon, Vt." (first noticed by us on page 229, Vol. XIV., SCIENTIFIC AMERICAN), and considered that the cause of ice forming in that and several other wells was owing to the nature of the soil and underground currents of air. Prof. Dawson, of Montreal, stated that he had met with similar phenomena in Nova Scotia, and accepted the views presented by Prof. Hitchcock. Mr. Hagar, of Proctorsville, Vt., said that from the first he had considered it owing to present causes. He had visited some abandoned iron mines in Essex, and had found ice in summer at a depth of 125 feet.

OZONE.

Professor Brocklesby then read a short paper on "Ozone." It gave the result of observations extended through a period of three months in the year 1857, for the purpose of endeavoring to ascertain the connection, if any, existing between that substance and atmospheric moisture. The conclusions arrived at were that it is most plentiful in the air during wet weather, particularly during the prevalence of easterly winds when loaded with moisture, less so when the winds are north-west, and least of all in dry weather.

[As ozone is principally due to electrical action in the atmosphere, its occurrence during the east winds which prevail on the Atlantic coasts may be the cause of those rheumatic pains with which persons in feeble health (as stated by physicians) are then affected:—EDS.

MUSIC.

Mr. J. H. Safford then read a paper on "The Mathematical Theory of Music." The subject was illustrated theoretically on the black-board, and the practical illustration may be made by a piano key-board. There are twelve semi-tones in the octave whose vibrations are made to harmonize as nearly as possible in the ratio of twelve halves. There is a disposition in the temperament of a piano to change. Those chords struck oftenest become the most harmonious, and those less frequently used become more discordant. The chord of A flat is but little used in church music. In old church organs, the chord of A flat major is frightfully discordant.

INFUSIBLE METALS.

Professor W. Gibbs, of New York, read an abstruse paper on "Platina, Iridium, Rhodium, Ruthenium, and Osmium," which are found in part or all alloyed together. He stated incidentally that the specific gravity of some osmiridium which he tested was 19·35, and some of the same obtained from California platinum he could not fuse even with the flame of a compound blow-pipe.

CARBONIFEROUS FLORA.

Professor Dawson, of Montreal, read a very important paper upon "The Fossil Flora of the Paleozoic Period, and the Devonian Period." He gave an interesting description of a fossil plant found at Gaspee, Nova Scotia, which had been mistaken for the fucoids. He had named it the *lepidodendron gaspeiana*. It belongs to the *coniferæ*. He had been shown specimens of fossils from Maine, which he believed would upon investigation show that there was an interesting flora yet to be discovered in the Devonian rocks of that State. He had made recent microscopic investigations, by boiling it in nitric acid and had been able to obtain good views of the atomic structure of the various fossils to be found in Nova Scotia coal. His microscopic observations were exceedingly minute and extended over a wide range. They were beautifully illustrated on carefully prepared diagrams. In regard to the mass of Nova Scotia coal it is of gymnospermous or cryptogamous origin, and the rate of accumulation must have been very slow. In a vertical foot of coal we may have the barks of successive generations of trees that were a hundred years in growing. The climate of the coal-producing eras was warm and moist, like the temperature of the southern hemisphere at the present day. The foliage of those times was dense and covered large plains; as trees fell they decayed, and a dense vegetation soon covered the whole mass. The growth of sigillaria was more rapid than that of trees at the present day of like size; still they did not spring up in a day or two, as some have supposed.

NORTHERN COLD.

Professor A. D. Bache then presented several valuable papers embodying the results of Dr. Kane's observations at Van Rensselaer harbor, North Greenland, in the years 1853–4–5. These observations were hourly made for almost two years, and include temperature, direction and force of the wind, and the varying atmospheric pressure as indicated by the barometer. He showed a diagram representing the diurnal variation of temperature for the month of May, when the sun is wholly above the horizon, and also for the month of December, when it is wholly below. The greatest cold was 66 degrees, in February 1854, and the greatest heat 51 degrees, in July, 1854. Mercury froze at 40·2 degrees. The average yearly temperature of the place was 2 1·2 degrees. It was found that calms tended to depress the temperature of the atmosphere, and winds to raise it. The frequency of calms is greater than all the winds from various quarters combined. Warm winds came from the direction of Spitzbergen, and cold winds from the north point of America. Professor Bache thought the establishing of this fact was worth all the trouble and expense which the Arctic expeditions had cost. Snow fell every month in the year, rain fell only in July. An elevation of 210 feet made a difference of 1 degree in the temperature of the air. The temperature of the the sea at the surface in winter was 28 degrees and constant. The mercury in the barometer stood highest in May, and lowest in September. The wind was east when the atmosphere was densest, and the warmest wind was from the north-east. The winds were generally from the east—the stormy quarter. During a fall of snow the weather was calm. Professor Henry said these facts were of the highest interest, and tended to prove that the heavy air descended at the poles, assertions to the contrary notwithstanding.

CENTRIFUGAL GOVERNORS.

This title has no reference to the governors of States but to a more unerring class of agents. A paper was read by Mr. Charles T. Porter on the effect of the centrifugal governor in the regulation of machinery; in theory it approaches more nearly to perfection than engineers have supposed possible. Mr. Porter is the inventor of the governor illustrated on page 36, Vol. XIV., SCIENTIFIC AMERICAN, where a full description of the nature of the improvement will be found. He employs a heavy counterbalance weight on the slide of the governor, and much lighter balls than those in common use, giving these a much higher velocity, so that the action of the governor upon the valve is very sensitive, because he obviates the usual counteracting resistance of the friction to the rapid action of the governor upon the valve.

SPIRITUAL SCIENCE.

Conceiving that the members of the association indulged too much in old bones, boulders and similar dry stuffs, Mr. Prince, of Flushing, L. I., very properly directed their attention to more refined matters, and wished to introduce a resolution for discussion, calling upon the association to recognize mentalism and spiritualism so far as they form the medium for the communication of knowledge to the human race. "You may refuse spiritualism a hearing," he said, "but if spiritual science courts investigation and you evade it, the world will form its own opinion and my purpose will be answered." He requested a committee of six to be appointed to investigate the subject. Mr. Prince was *coughed down.*

LIGHTNING IN GAS-PIPES.

Professor B. Silliman, of Yale College, read a paper which stated that during the past year two cases had fallen under his observation of the discharge of atmospheric electricity through the iron gas-mains of New Haven, with effects, which, so far as he knew, had not been previously noticed. On the last Sunday of June, 1858, a violent thunderbolt on the spire (227 feet high) of the Wooster-place Baptist church, in New Haven, was carried without injury to a point less than 25 feet from the earth. On this point, owing, as was afterwards ascertained, to an imperfect ground termination of the conductor, the electric tension was sufficient to produce a discharge through a wall of brick nearly twenty inches in thickness to meet a gas-pipe on the side of the wall, directly opposite to the lightning conductor. By the new channel thus forcibly gained, the discharge was conducted to the main pipes of distribution, and no further immediate effects were seen. Soon afterwards, however, the escape of gas on the street in front of the church was noticed, as well by the odor as by the sickly condition of the shade trees lining the street. Upon opening the ground it was found to be saturated with gas, and every joint in the whole length of the street (some forty in number) was discovered to be leaking profusely. The inference seemed unavoidable that the leakage was occasioned by the electrical discharge.

During the last week of July, 1859, another very energetic discharge fell upon a house in George-street, New Haven, which was supplied with gas, and while but little injury was done to the house, and none at all to its inhabitants, the gas mains in the whole street, to the number of over sixty joints, were found to be leaking profusely.

These effects are plainly due to the sudden and explosive expansion of the gas in the mains at the point of electrical discharge, and notwithstanding the enormous extent of the metallic circuit—over twenty miles of pipes buried in moist earth.

LUMINOUSNESS OF THE ATMOSPHERE.

A paper was then read by Rev. George Jones, U. S. A., on "The Occasional Luminousness of the Atmosphere on the Summits of the Andes." He referred to the case mentioned by Baron Humboldt in his "Cosmos," which occurred in Germany about the year 1833, when the atmosphere was so luminous that people could see to read fine print. While at Quito, in 1856–7, he (Mr. Jones) noticed a similar luminousness, not constant, but occasional, and made records of the phenomenon. About that time and before he had spoken to any one about it, an Irish gentleman, Col. Lanegan, who had taken part in the revolutionary struggle in Ecuador, mentioned a similar case which he had observed at Macheche, about three days' journey from Quito, when the light was so bright that his servant called him up, and they started on a journey supposing it to be day, but after a while it became so dark that they could not see at all. Mr. Jones said his own observations were made in cloudy nights when he could get no light from the stars, and the luminousness of the atmosphere was such at times that he could read the headings of newspapers—the N. Y. *Herald* and N. Y. *Journal of Commerce*, for instance. The next night, perhaps, would be so dark that he could not see his hand twelve inches from his face. The newspapers state that the St. Louis æronauts had a similar luminous atmosphere about them at night, and were able to distinguish the figures on the dials of their watches. He could not account for this phenomonon unless on the supposition that all space was filled with luminous matter, that vibratory matter is self-luminous, and that it is sometimes swept by us in dense waves.

VARIATIONS OF THE SEASONS.

Rev. Mr. Burnap, of Baltimore, presented a paper in which he showed the great variations in particular seasons. The causes of variation were the inclination of the sun to the ecliptic; the conformation of continents; the ocean currents; the currents of air; the formation of clouds. The most probable cause is the influence of

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the moon, changing the motion of the water in the ocean twice a day, and affecting also the atmosphere, which, being a ponderable body like water, must move in tidal swells. Electricity was another cause. The sun also was a force making itself felt in the variation. In conclusion he said that the wisest observer will find it unsafe to risk his reputation on definite predictions. He will find himself embarrassed and misled by his own rules, and the exceptions will multiply upon him so fast as finally to annihilate them altogether.

VERMONT WHALES.

Mr. F. Hitchcock Jr., of Easthampton, exhibited a fossil whale found in 1849, on the line of the Rutland and Burlington Railroad, in the town of Charlotte. It was imbedded in clay, about eight feet below the surface of the ground, was exhumed from one of the deep excavations, and is in a good state of preservation; but few bones being wanting. It was found many hundred feet above the sea which is conclusive that the ocean once rolled over the Green Mountains. This skeleton belongs to the State cabinet of Vermont, and is a part of the valuable collection of the late Professor Z. Thompson, illustrating, more perfectly than any other collection, the zoology of Vermont. The bones have been put in position, and any one who has a smattering of knowledge in comparative anatomy can readily see that it belongs to the whale family. The blow-holes are distinct. It resembles the living rather the extinct type, and the osteology of the head is very like the small northern whale. They have been carefully scrutinized by Agassiz, who has pronounced the conclusion arrived at by Mr. Tompson to be correct. There are 52 vertebrae in the skeleton. The total length of the animal must have been 14 feet. The locality where it was found was one and a half miles from Lake Champlain, 60 feet above it, and 150 feet above the ocean. Sir Wm. E. Logan afterward spoke of some few bones found at Montreal, which seemed identical with this skeleton, but he was not certain to what species it belonged to. This is one of the most extraordinary discoveries of fossils yet made on our continent.

WISCONSIN BONES.

Professor J. D. Whitney exhibited fossil bones and teeth found in the northwest, in the lead region. In the cap rock, as it is called by the miners, there are fissures and cavities, from 50 to 100 feet beneath the surface. These cavities are usually lined with lead ore; in them are found the teeth of the mastodon; also of the buffalo. The teeth were in a good state of preservation. They are found in many localities. He believed that this part of the country never was subject to the drift, as no boulders were to be found. Beneath the surface to the depth of 50 feet, vegetable formations are found. The legitimate conclusions were that this was the home of the mastodons, and that they existed immediately prior to the advent of man.

WHAT SHOULD MECHANICAL WORKMEN BE TAUGHT?

This is an important question in this country, where the mechanical trades are so eagerly and industriously followed, and we are pleased at being enabled to give an abstract of a lecture from the London *Builder*, delivered by Mr. Scott Russell, F.R.S., builder of the *Great Eastern*, and proprietor of an immense machine-shop on the banks of the Thames. The lecturer said they should learn drawing and theoretic mechanics, plane trigonometry and solid geometry, conic sections and the nature of curves. To do this, when the men who have to learn are engaged 10 or 12 hours a day at hard physical labor, will require a new set of text-books, interesting and truthful; night-schools, where learning is made a pleasure and not an extra toil; and teachers whose heart and soul is in the work. Mr. Russell thinks that governmental aid ought to be secured to pay the expenses, especially of the books. He concluded by giving forth the idea that machinery would, in time, do all the unintellectual part of the mechanic's labor, and that the mechanic himself would be only the thinking and inventing machine of the works; and he made his address very practical by saying that he would give all men who had received such an education $15 per week, to commence, and afterwards raise them to be foremen, at $2,500 a year.

We cannot help reflecting, as we write, how many thousands of dollars, and how much wasted brainwork would have been saved to the inventors of this country, if our common schools had paid more attention to the physical and mathematical sciences than they have hitherto done; and how much time we should have had for other and more useful purposes than endeavoring to convince men of their folly in trying to invent against the laws of nature, which they did not know, if they had learned those laws in early youth. Now that the world is so eminently practical, and the mechanic arts are so predominant, educational systems must change, and geometry take the place of rhetoric, and the laws of bodies in motion and at rest throw æsthetic philosophy into the shade. Scott Russell has led off the ball, and we shall be anxious to hear of his followers.

STAEM-BOILER EXPLOSIONS.

MESSRS EDITORS:—The recent explosion of our steam boiler, throwing it to a distance of nearly half a mile, has given rise to many speculations in explanation of the cause. We need not resort to any mysterious, undefinable explanation, which is often preferred to the simple, reliable information most always at command.

There is no doubt in our minds that it was the result of mere pressure of steam without the means of escape. There is no evidence that there was an inadequate supply of water. It doubtless had its origin in undue pressure from progressive accumulation of steam of great pressure and density rapidly rising to a degree beyond the strength of the metal, with the safety valve inoperative at the time, as it has since been ascertained.

The safety valve had become so out of order that it would leak under a low pressure; the engineer had fastened it down with a hook so arranged that (he supposed) it would yield under a pressure within the strength of the boiler. Similar causes, if subsequently known, would no doubt explain nine-tenths of all the explosions that take place, which, if unexplained, often lead the minds of persons away from the true source of the evil, and thus produce carelessness or indifference in the care of boilers.

We are happy to say that some of our men who were injured have been out, and the others we trust will be at their work in a week or two. We are again in operation with a set of new boilers manufactured by Messrs. Rice & Goddard, of this city, of a new construction of extraordinary promise both for safety and economy of fuel. ICHABOD WASHBURN.

Worcester, Mass., August, 1859.

[The letter of our correspondent corroborates in a clear and candid manner the views which we expressed on the subject on page 85 of the present volume of the SCIENTIFIC AMERICAN, and we are much obliged to Mr. Washburn for giving the public such a correct and timely version of the accident. In a recent number of our able cotemporary—the London *Engineer*—Mr. Desmod G. Fitzgerald discusses the electrical theory of steam-boiler explosions in a very scientific and able manner, and he expresses opinions very similar to those which we published on page 301 of Vol. XIV, SCIENTIFIC AMERICAN, and on page 85 of this volume.

NEW INVENTIONS.

EVAPORATING PANS.—We notice in this week's list of claims two patents for these useful articles. One is the invention of Evan Skelly, of Plaquemine, La., and it consists in the employment, for heating the contents of an evaporating pan, of a steam heater made of two conical corrugated plates of galvanized iron, copper or other metal, united by a central ring and external flanges, by which a rapid natural circulation of the liquid or solution to be evaporated, over the heating surface, is obtained.

The other is the invention of H. O. Ames, of New Orleans, La., and consists in a certain arrangement of the evaporating, supply, and escape steam-pipes, and their connections, whereby provision is made for heating all parts of the pan to a uniform or nearly uniform temperature, the collection of the water of condensation to any extent in the evaporating pipes is effectually prevented, all the connections of the pipes are brought outside of the pan, and provision is made for the repair of the pipes and for the removal of such of the evaporating pipes as may be necessary for repair or other purpose without rendering it necessary to stop the operation until it is replaced.

SEWING MACHINES.—William F. Pratt, of Bristol, Pa. has invented some improvements in this interesting machine, which relate to that kind in which a lock-stitch is produced by means of the combination of an eye-pointed needle, an oscillating looper, and a nearly stationary thread-case. The invention consists in a novel construction of the thread-case and of the slide ring that is employed to hold it in proper relation to the oscillating looper, whereby the loops of the needle thread are properly checked und controlled in their passage over the thread case, and the looper is prevented catching the loops that have been extended and have received the locking thread. It further consists in a certain method of producing the oscillating movement of the looper.

R. Eickemeyer, of Yonkers, N. Y, has invented a machine for sewing in the lining of hats, the invention of which consists in certain novel modes of applying, arranging and combining devices which are common to other sewing machines, and in novel contrivances employed in combination therewith, the whole combining to constitute a new kind of sewing machine adapted for sewing in the lining of hats around what is termed by hatters the "band," that is to say, the angle formed at the junction of the brim with the part of the hat which fits the head, the machine making a seam of novel character. The inventor has assigned the patent to himself and E. Underhill, of the same place.

PAPER-CUTTING MACHINES.—E. Bu roughs, of Rochester, N. Y., has invented an improvement which relates to a machine for cutting paper for the use of printers, book-binders, and others, and consists in the employment of an oscillating, reciprocating knife, arranged and operating in a peculiar way, and used in connection with a movable bed for adjusting the paper beneath the knife, and a clamp for holding the paper in proper position on the bed while being cut. The object of the invention is to obtain a machine that may be readily manipulated, and capable of being operated either manually or by other power, and one that may be driven with a small or moderate application of it.

LOCOMOTIVE FIRE-BOX—This improvement, although applicable to all steam boilers, is more especially designed for coal-burning locomotives. Its object is to consume the inflammable products of imperfect combustion, and at the same time present to the direct action of the fire a large area of heating surface, thereby economizing in fuel, and augmenting generally the efficiency of coal-burning locomotives. The invention consists in the employment of a "midfeather" or water-chamber placed directly over the fire and provided with a plurality of small flues which form a communication between the fire-box and a gas-chamber above, into which, as well as into the fire below, air is admitted through hollow stay-bolts at the sides and end of the boiler, and the desired object attained. The inventor is Ralph Greenwood, of Altoona, Pa.

STATION AND STREET INDICATGR FOR RAILROAD CARS.—Lewis Koch, of New York, has invented a very convenient apparatus as an addition to railroad cars; it consists of an apron or belt which is attached to rollers and placed within the car at any suitable spot, and it is operated with a continuous movement from one of the axles of the car by any suitable gearing. The apron or band has the names of the stations or streets painted or marked on it at the proper points and an index projecting over the edge of the apron so as to point out the precise situation of the car both when in motion and at rest, that is to say, the station or street is not only indicated when the car is stopped, but the intermediate points are pointed out on the apron by the index as the car passes along, so that the passengers can know at any time how far they have proceeded on their journey and how far distant they are from their destination. The inventor has assigned this valuable device to himself and H. Forstrick, of this city.

NAIL-PLATE FEEDER.—In the manufacture of cut nails the plate from which they are cut has to be turned over as each nail is cut to give the proper taper to the next, and this invention of J. P. Sherwood, of Fort Edward, N. Y. causes this turning over to be performed by the action of drawing back the plate. This is performed by suitable mechanism which cannot be explained without the aid of drawings.

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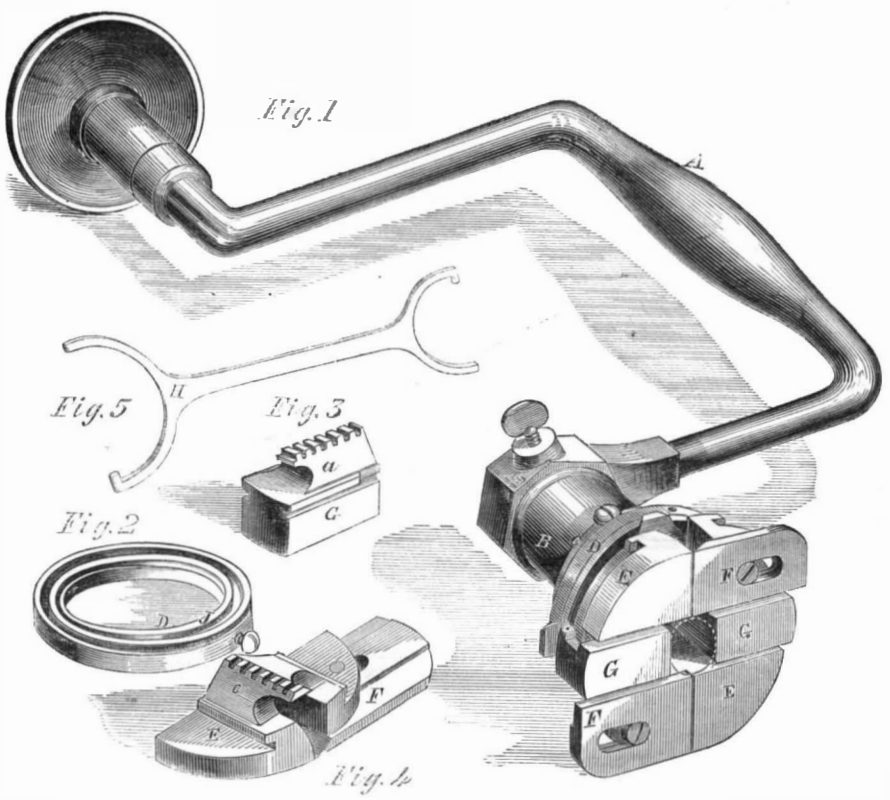
IMPROVED EXPANDING AUGER.

Every wheelwright is aware of the trouble attending the use of the common hollow auger for boring the tenons on spokes; often the hollow auger that bores the tenons and the bit that bores the round mortise in the felloes do not correspond, and the consequence is that the spoke and the felloe do not fit; again, even if the bit and stock correspond they wear with use, the hollow auger becoming larger and the bit wearing smaller, so that they soon cease to fit with that accuracy so necessary to make a perfect wheel. It is also frequently desirable to alter the size of the tenons, which cannot be done without changing the auger, and there are sizes of tenons not provided for by the present hollow auger, as for example the nine-sixteenths, eleven-sixteenths, thirteen-sixteenths and fifteen-sixteenths of an inch. All these difficulties are overcome by the invention of C. J. L. Meyer, of Newark, N. J., which was patented March 29, 1859. This implement will cut tenons from ½ to 1 inch, rable, the sections F and G, and the scroll-plate D all being case-hardened; every wheelwright and mechanic should possess themselves of one, as it will prove a very useful tool in any shop where wood-working is carried on.

Any further information can be obtained from the inventor at Wright's Machinery Depot, 30 Market-street, Newark, N. J., where the tools can be seen and rights negotiated.



MEYER'S IMPROVED EXPANDING AUGER.

and admits of being adjusted in a moment to any size between those so as to make a perfect fit to any bit.

Fig. 1 is a perspective view of the whole implement, A being the handle of an ordinary bit, and B the cylinder of the cutting tool, which is secured to the handle, but may be obtained separate if desired. D is a ring which has a thread or worm cut inside, so that it fits in notches on the inside of the pieces that have the cutters attached and in similar notches in the other pieces which are movable in the tool. This screw is seen at J, in the detached view of the ring, Fig. 2. A ring, C, behind D secures it in its proper position on the cylinder or barrel, B. E is a solid segment to the face of which the cutter, F, is properly secured. This is seen separate in Fig. 4, *c*, being the notches by which it is adjusted by D. G is an adjustable blank or surface that gives a bearing to the wood while being cut, it is seen separate in Fig. 3, *a*, being the notches on it to render it capable of proper adjustment. H, Fig. 5, is a key for moving the rings C and D, and so causing the cutters and the blanks to come closer together or go further apart to make a tenon of the desired size. The tenon is shown in dotted lines, the end of the spoke being placed against the face of the tool and the tool rotated, the tenon passes inside as it is cut and the tool is self-centering. It does not take the power of the common tool to work, as the tenon on the spoke is only held on four lines instead of all around, and consequently the resistance from the friction of the tool itself is lessened. Such an implement has long been a desideratum and many attempts have been made to produce one, but each has had either the serious fault of difficulty of use or complexity of construction. This tool as is seen is simple, strong and du-

LACES AND EMBROIDERIES.

In no one article, perhaps, is female extravagance in dress carried to a greater length than in the use of elegant and costly laces and embroideries. Almost fabulous prices are sometimes paid for them. The rich laces in this country are imported principally from France and Belgium. The costliest specimens of lace are easily disposed of. Lace at twenty shillings ($5) a yard—and that but one-tenth of a yard wide—finds ready purchasers. The demand for rich laces is constantly increasing, outrunning the supply, thus appreciating the prices; and consequently the genuine article can only be worn by the wealthy.

Belgium supplies us with more laces than all the countries of Europe together, and laces of the rarest kind, finest quality and most artistic design. In fact, lace is indigenous to Belgium, and has been so for generations. In some parts of Belgium the flowers are made separately, and then worked into the ground, while others carry on the pattern and the design together. The division of labor is very great.

The labor of washing lace is almost an art, and only the most skillful in that line are engaged in it. After washing, lace is spread out to dry on a cushioned table, and pins of a peculiar shape are run through each hole to prevent it from shrinking. When very fine, or the pattern intricate, an entire day will be spent upon one yard of lace. "Mechlin" was formerly the "queen of lace," but Point de Venise antique now occupies the first place. It is a rare old lace, light and open, raised in some parts like embossed work, and has an air of antiquity that is highly prized. The manufacture of it is said to be entirely abandoned, and it is only found now as heirlooms in families, except when a stray specimen finds its way into market, in which case there is a great competition for its possession. The Point de Venise antique is more frequently seen in Italy than in any other country, for the high dignitaries of the Catholic Church have their official robes trimmed with flounces of this costly material. It finds its way into England chiefly through the medium of travelers, who seize upon every opportunity to obtain these relics of ancient fashion.

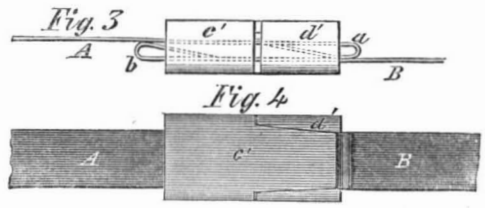
Next in value is Point d'Alengon. It has a dingy hue, and the first idea connected with it by unsophisticated minds is that it wants washing. Fashion, however, corrects this notion. Point de glaze is as fine as a spider's web, and as light as thistle down. Brussels point d'applique ranks very high. It is formed by sewing sprigs of the real point upon illusion or any other kind of plain lace. It is very much used for flounces, and costs from six to eight pounds per yard, five-eighths wide. It is very pure in color, which is owing to a white powder with which it is saturated, and which it continues to retain, and obviates the necessity of washing.

Honiton lace came into fashion in 1842, and owes its present position to Queen Victoria. Commisserating the miserable condition of the lace-workers of Devon, she determined to assist them by bringing their manufacture into fashion, and in furtherance of this laudable purpose had her wedding dress made of it. Honiton at once became the rage, and has continued popular and expensive ever since, although, previously, purchasers could hardly be found for it. Chantilly lace is always black, is exceedingly fine, and is much used for veils and flounces.

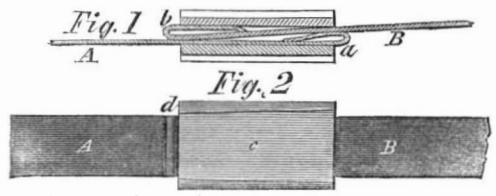
Our supply of the more elaborate specimens of embroideries is derived from France and Switzerland. Although the Swiss are really superior to the French, yet so despotically do French fabrics rule the fashionable world, that the former are obliged to be sold as French.—*Sharpe's London Magazine.*

IMPROVED HOOP-LOCK.

This invention is intended to secure together the ends of bale hoops, and is so designed that it can be quickly and securely fastened or unfastened by a laborer or other person but is not likely to become loose from the ordinary handling of a bale or the exigencies of transportation.



Figs. 1 and 2 show one form of the invention, Fig. 1 being a section and Fig. 2 a top view. A and B are the ends of the hoop having their extreme ends at *a*, and *b*, turned inwards to form a sort of loop; a socket of metal *d*, is open at the top and has dovetail slots in its upright sides so that the top, *c*, which has angular edges can be slid in the grooves, when *a*, and *b*, have been placed in *d*, and hold both the ends of the bale hoop perfectly secure.



Figs. 3 and 4, a section and top view, show another form of the invention where the socket is divided into two parts, *c'*, and *d'*, both of which slide over the loops *a*, and *b*, and *c'*, has a tongue that fits into a dovetailed groove in *d'*, as in the other form.

The inventor of this simple little device is Edward Davidson, of Batesville, Ark., and he will be happy to give any further information upon being addressed. The patent is granted this week, and the claim will be found on another page.

FLYING MACHINE.—The *Mansfield* (Ohio) *Herald* is informed that a gentleman residing near that city, Mr. D. M. Cook, well known as the inventor of the popular Sorgum Evaporator extensively sold throughout the West, is now engaged in the construction of a flying machine. Mr. C. is quite sanguine of success. We are ignorant of the details on which his air-ship is to be built, but we understand that, while a balloon is to be used for elevation, steam is to be the motive power. The inventor is quite sanguine that he has discovered the proper machinery whereby the air may be navigated at will. He has built, or is about to build, a house for the purpose of containing his labor without being annoyed by the curious.

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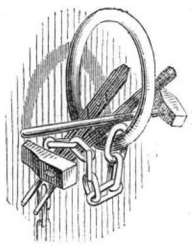
VOL. I., No. 8.....[NEW SERIES.]..... *Fifteenth Year.*

NEW YORK, SATURDAY, AUGUST 20, 1859.

OUR MANUFACTURING INTERESTS.



OUR politicians sometimes endeavor to make it appear that a tariff of protection to home industry will bear unequally upon various classes; and they assert that, while it might for a time benefit the manufacturer, on the other hand it would in some way ultimately injure the planter and general producer. The idea of a tariff for protection has long been a foot-ball for two great parties to kick, and at last they have partially covered it up in other political issues. We do not propose to discuss the question of a tariff, as government ought to be competent, from its experience, to draw the line of happy medium between the seemingly conflicting interests of a great and growing people. We have this to say, however, that the importation of manufactured goods into our country from abroad has been lately going on at a fearful rate, costing millions of our golden treasure, and many of our manufacturers are beginning to feel this competition. We should never willingly see the mechanics, artizans and laborers of our country compelled to receive the same wages that are paid abroad. How shall this contingency be avoided? and how shall we, as a people, develop our vast and unparalleled resources, and thus advance the interests of the country and its productive power? We say emphatically our reliance is mainly in the skill of our inventors and mechanics. This conclusion is borne out, in regard to its correctness, by the entire history of those American arts in which we have become distinguished and successful. In the manufacture of common clocks, for example, great numbers of which were annually exported to almost every country on the face of the globe, it was the genius of our inventors which devised the superior machinery for making their parts, and which has enabled us to defy competition at home and abroad. It is the same with light carriages, coarse textile fabrics, india-rubber goods, and some other manufactures; and if this is so in one case, the inevitable conclusion is, that it may be so in every case. England is the workshop of the world, and in competition upon equal terms, it is stated that she has no equal for almost every article which is manufactured within her borders. How can this be accounted for? By the vast sums which her capitalists are in the constant habit of expending for new improvements in machinery. Her wisest statesmen and her leading noblemen—the prince and the premier—acknowledge that the mechanics and artizans are the life-blood of the nation; and to maintain the power of Britain among the kingdoms of the earth, the government has recently devoted large sums and much attention to scientific schools, more especially for instructing the youth in those branches of education which will render them superior mechanics and artizans. In a recent speech of Lord Napier (late representative of the Court of St. James to our country) at the Society of Arts' dinner in London, he said:—"It cannot be too often repeated, that more than half the population of the British empire live by arts, manufactures, and commerce—that is, *they subsist on the results of skilled labor, or labor directed by invention and design* in contradistinction to the simpler forms of industry." In another place he says:—"We can only maintain our superiority by ceaseless vigilance and exertion," and "it is our bounden duty to levy from every department of intellectual inquiry, auxiliaries in maintaining and enlarging our present ascendancy." "If the markets of continental Europe be partly closed against us, by the existence of older establishments, by conventionalities and the impediments of legislation, we may still find in the markets of rising states, in those which have been planted by our own race in the plains of America and Australia, a fair field and ample scope for the higher departments of *invention and design.*"

It is thus that the leading statesmen of Great Britain recognize the true source of that country's material greatness—the inventive genius and skill of the people!

We recognize the same mental forces as the grand levers of our advancement in the arts, and our reliance is fixed upon our inventors and skilled mechanics for elevating our country to higher eminences in industrial progress. Unless we advance with rapid strides in invention, we will assuredly fall further behind the other nations which now compete with us in those products which are sold in our marts. The question is not with us, "Can we do so?" but, "Shall we do so?" We have natural resources for manufacturing purposes unequaled in extent by those of any other people, and we have vast mental resources also. Our manufacturers must bring to their aid the highest intellectual abilities and mechanical skill, and open their hands wide for encouragement, if they wish to maintain their own position in the great manufacturing struggle which is now going on among the nations.

A NEW TELEGRAPH.

A pamphlet has recently been published in England, under the title of "The Globe Telegraph," by Septimus Beardmore, C. E., in which it is proposed to employ, for telegraphing on long lines, a principle of operation different to that which has hitherto been exclusively used. There are two kinds of electricities developed by distinctive batteries, namely, *tension* and *quantity*. The former is developed in a very active battery composed of a considerable number of small plates, the latter in a battery of a very few large plates. Tension electricity meets with great resistance from induction in cables, while very little of such resistance is experienced in using electricity of quantity. Electricity of very high tension was employed on the Atlantic cable, as it is used on our telegraph lines. The author of this pamphlet referred to proposes to use quantity electricity as a substitute for that of tension, and in doing so candidly confesses that he is not the first person who has done so, nor the first who has shown its practicability. This credit is given to Alexander Bain, who, in 1843, took out a patent for employing electric currents in telegraphing, generated by positive and negative plates forming a simple voltaic couple. All those who are versed in the history of the application of electricity to the arts will remember that Mr. Bain's battery for moving his electric clocks consisted of a large plate of baked carbon and a plate of zinc simply buried in the moist earth, and connected by a single wire. In its application to telegraphic purposes, he did not seem to have attached much value to this invention, as it was inferior to the tension battery, because return signals could not be obtained by it, and therefore he made but little use of it. Taking up this system, where it had been left by its first inventor, M. Hoga, about a year ago, commenced a series of experiments in England for applying it to submarine cables, upon which it would be most useful for obviating the evils of *inductive* resistance, were it in other respects applicable. The results of these experiments were so far flattering, upon a line of six miles of wire in one case, and on a cable 110 miles long, between Guernsey and Southampton, in another, that they ended in securing a patent in the names of Messrs. Hoga, Piggott & Beardmore, on the 17th of last November.

This improvement on Bain's system consists in a method of obtaining return signals by employing in the line a metal intermediate in its character between copper and zinc. A plate of iron is therefore stated to fulfill this condition; consequently, plates of copper, zinc and iron are employed at each side to produce positive and reverse signals, and by this means a remedy is proposed for the evils of induction, to render telegraphing on long lines as practical as on short circuits. This invention is certainly quite novel, and has drawn out considerable discussion in foreign scientific periodicals. In contemplating its probable success for overcoming the evils of static electricity in ocean cables, the *direct* resistance which is experienced in every conductor, no matter what battery is used, seems to have been in a great measure overlooked. The reason why batteries of very high intensity have to be employed on long lines is for the purpose of overcoming direct resistance, and in this respect the quantity battery (Globe Telegraph) does not appear to be suitable. At the same time, while we make this statement, we must admit that electricity is such a subtile agent that we are almost ready to admit that nothing is impossible to it in the hands of inventors, considering what great results have been accomplished within the short space of twenty years, in which electro-telegraphy and electro-plating have attained to such magnificent proportions in the useful arts.

THE PATENT OFFICE REPORTS FOR 1858.

In answer to numerous inquiries about the Patent Office Reports for the last year, we would state that the two volumes containing the claims are already issued; those containing the illustrations are in press, but it is uncertain at what time they will appear. As the Commissioner of Patents receives but a limited number of these reports, he can supply but few of the calls that are made upon him for them; and he has no stock on hand for sale, as some seem to suppose when they inquire of us, "how much does the Commissioner of Patents charge per volume for his annual reports?" That officer only supplies the patentees for the year, and such other persons as have a recognized business connection with the Patent Office. The great bulk of the reports are handed over for gratuitous circulation to patriotic Senators and Representatives, each of whose autographs, when seen on the brown Manilla wrappers that cover the volumes, sends a thrill of grateful emotion through the veins of the constituent who is thus noticed, to the exclusion of his more humble neighbor. Those of our readers who cannot, for reasons indicated, receive the direct autographical attention of the Commissioner of Patents (who, by the way, is an excellent penman), should lose no time in finding out the name and post-office address of the members of Congress for their respective districts, and make formal application to them for copies of the reports. No one of our readers need feel afraid to write to a live member of Congress. We have seen and conversed with many of them in our day, and have invariably found them made up of flesh, blood and bone, and they are not always perfect Masters of Arts or professors of the *Belles Lettres*.

The demands for these useful reports are increasing every year, and it is therefore important that they should be *well* circulated; we mean by this, that they should be placed in all our libraries that are accessible to the public, sent to every editor who reads and writes, and circulated gratuitously, so far as they will go, among that class of citizens who know the difference between the modern spinning-jenny and the old-fashioned "quill" wheel, whose music has so often hummed in our ears. We heard a Senator once declare—while speaking against appropriating money for the publication of such "trash" as he thought these reports contained—that he had bags of them at a certain post-office in his State, but did not know what to do with them. This same grave Senator could undoubtedly have found open channels for the distribution of his political verbiage to the extent of thousands of copies, yet he was dumbfounded with ignorance when he found himself encumbered with a few mail-bags of patent reports, showing forth the progress of the nation's material interests which he in part represented. This stupid indifference gives a clue to the reason why session after session of Congress treats the Patent Office and its interests as though such things existed in Spitzbergen instead of at the Federal capitol.

The Commissioner of Patents would make the most proper distribution of these reports, and ought to have them under his sole control. There are thousands of persons who want these reports, and yet never receive them; we confidently believe this, from the vast number of applications made to us for them, every year.

THE PEABODY INSTITUTE AT BALTIMORE. — This building is now progressing rapidly, and is expected to be inclosed by the first of November next. The walls are of Maryland marble, and present a commanding appearance. The arch-girders, to which we alluded two weeks ago, for sustaining the walls of the lecture-room, are now in place and secured. Each girder is a composite of cast iron and wire cables—a combination of the best materials for sustaining tensile and crushing strains.

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THE FATHERS OF PHILOSOPHY.—VIII.

ARISTOTLE.

Thrace—so celebrated in the legends of the chivalrous deeds of the Seven Champions of Christendom, as having been the scene of so many of their exploits, and so full of nymphs and fairies, by which a poetic people imagined all the visible woods and forests, lakes and rivers, and the air, at "early morn and dewy eve," were tenanted—was the scene of deeds of greater real interest than the rescuing of an imaginary princess from a fictional dragon's mouth, and was inhabited by better men than the runaway pork-seller of Cappadocia, St. George, of England. It was at Stagira, on the coast of this country, that Aristotle was born, in 384 B. C., and he was a member of a rich and distinguished family, one of his ancestors being Æsculapius, who accompanied the Argonauts on the expedition to obtain the golden fleece, and whose skill in medicine raised him with the vulgar to a place among the gods. The father of our subject was physician to the King of Macedon, and had written six books on medicine and philosophy. His parents died while he was young, and left him an immense patrimony, and at the age of 17, following the love of study that was innate in him. he went to Athens, and there listened to Plato's wondrous discourses. His a siduity and eagerness soon brought the philosopher's attention on the boy, and he discovered that he must be checked rather than urged in his studies. Plato named him the "soul of the school," and if he was absent from a prelection, the old man would complain that "intellect was not there," so much did he esteem him above his fellows. He was much addicted to the decoration of his person, wearing ornaments of great value, and shaved both his head and face, while the other scholars allowed the hair to grow. In stature, Aristotle was short; his eyes were small, his limbs were unnaturally slender, and he lisped and hesitated in his speech.

Such was his youth; let us see his manhood. Plato died when Aristotle was 36 years of age, and the pupil wrote an epitaph, which was inscribed on his master's tomb:—

"To Plato's sacred name his tomb is reared,
A name by Aristo le long revered;
Far hence, ye vulgar herd! nor dare to stain,
With impious praise, this ever-hallowed fane."

Disappointed that he did not succeed his preceptor, he left Athens and joined his friend Hermias, who had elevated himself from a dependent position to be the king of two Greek cities, A sus and Atarna; and there he saw the grand sight of philosophy on the throne. Hermias was, however, dethroned in three years and killed by Artaxerxes, of Persia, and Aristotle had to fly with his adopted daughter, Pythias, whom he afterwards married. He soon became a widower, and undertook the charge of educating Alexander the Great, a task which he performed so well that he not only made him a master of the sciences, and expert in all physical exercises, but also taught him to command his imperious temper, and won his pupil's profoundest affection; and Alexander gave proofs of his regard by sending him strange animals from the countries he conquered, to enable the philosopher the more accurately to write his natural history. Returning to Athens, he obtained a large building in the suburbs of the city, called the "Lyceum," for the purposes of public instruction; and here he delivered his lectures and founded his Peripatetic ect, so-called because it was taught as the lecturer walked about in the building.

"Envy, hatred and malice, and all uncharitableness," were as rife in those days as they are now, and even learned men were as subject to their baneful influence as the most unlearned person; and they were brought to bear upon poor Aristotle by his rivals, who succeeded in driving him away from the city by false accusations, a sham trial, and an unjust sentence. He died in exile, at the age of 63, at the town of Chalcis, in Bubœa.

He was without pride, yet not fawning; temperate, without being austere, and cultivated every domestic and social virtue as the basis of public morality; and we learn that he regarded, with equal contempt, vain pretenders to real science, or real professors of sciences which he deemed unproductive of public benefit. In short, he was a man to be admired.

As an author on the physical sciences, he had, up to that time, no equal; and he wrote the histories of the heavens and earth, of animals, plants and minerals, and man considered simply as an animal, bringing all his information down to his own time, and commenting from the resources of his own fund of knowledge. His scientific treaties were 24 in number, all characterized by the same spirit of research, learning and experimental knowledge. He dissected many animals, especially fishes. If not the inventor, he was the introducer of syllogystical reasoning, which we can illustrate by an example:—

"All animals have the sense of touch.
A dog is an animal.
Therefore, a dog has the sense of touch."

These are denominated the major and minor propositions and the conclusion. He was twice married, and left behind him a son, to whom he confided his papers, of which copies were taken, and by the copyists of the learned, we have been enabled to preserve the contents of most of them until the present day.

GIVE TO MECHANICS WHAT BELONGS TO THEM!

During the last session of Congress, the question came up for discussion in the House of Representatives to provide for the extension of the Post Office at Washington. Recently, in looking over some scraps, which it is our habit to collect, we came across the following brief and sensible speech by Hon. W. T. Avery, of Tennessee. The sentiments which he utters are noble, truthful, and to the point, and will find a response in the heart of every reader of the SCIENTIFIC AMERICAN:—

"I wish, sir, to put upon record my protest against what seems to be a growing policy of appointing army officers to superintend the erection and construction of the public buildings of the country. While I entertain as high a regard for the army, and the officers of the army, as any gentleman upon this floor, I must say that I am opposed to their being appointed to these positions over the practical mechanic, the architect who has spent his whole life in the study not only of the theory, but the practice of his profession. Officers educated at West Point are schooled in the arts of war, in the construction of fortifications, in the erection of forts; but what, I ask, do they know or can they know about the construction and erection of courthouses, custom-houses, post-offices, or any other building of this character, without practical experience? This policy, in my judgment, works a great hardship upon the rights of the great mechanical class of this country. They are superseded. They are shut out from having any part in these highly important and responsible positions. They are thus cut off from an opportunity of distinguishing themselves in these great natural fields of their peculiar profession. Sir, there are mechanics, civil engineers, and architects in my district, in my city, far more competent to fill these important offices of public trust—to superintend, direct, and control the erection of public buildings, be they great or small—than any army officer can possibly be. Those gentlemen educated at West Point learn only the theory of a profession which the enlightened civil engineer knows by practice. As well might the planter, in employing an overseer to manage his plantation, discard all applicants who were farmers by profession, and employ only such as know theory and no practice—a book farmer. What would be thought of such a planter? I am for opening this great theater for the development of talent, skill, and genius wide to the free competition and advancement of the working, practical mechanics all over this nation. Sir, they are everywhere in every city, and in their behalf I protest against their being superseded by army officers. There is another idea connected with this subject. The profession of the army, the study of war and the arts of war, naturally inculcates a notion to order, to command imperatively, which to the undisciplined civilian smacks of tyranny, which the honest, industrious, intelligent mechanic, with his inborn American notions of equality and independence, cannot brook. I am for the army in its place. I am proud of the American army, its officers and its men. It has shed immortal luster on the American name. But give unto the army things that are the army's, and unto the civilian the things that are the civilian's."

THE Honorable Charles Mason, of Iowa, late Commissioner of Patents, is now running as a candidate for Judge of the Supreme Court of that State. It is said to be probable that he will be elected.

WOOL-GROWERS' FAIR.

The importance of Cleveland, Ohio, as a wool market is evidenced by the significant fact that recently there has been held in that beautiful Lake City a wool-growers' fair. There is also published a journal devoted to the interests of wool-growing.

The fair just terminated was one of the greatest exhibitions of the kind ever held in the West, and is calculated to be of immense importance to the sheep-raising interests. It is the first affair of the kind ever held there, and the fact of its great and unexpected success is proof sufficient of the need of such an institution. The whole number of lots was about 140, and the number of pounds about 680,000.

The Cleveland *Herald* gives the following account o the sales and prices:—

"Messrs. Harbaugh & Co., of Pittsburgh, bought 14,000 lbs. of common to quarter-blood fleece at 34 cents; a lot of tub-washed at 40 cents; two lots fine fleece, full-blooded, at 48½ cents; 5,000 lbs. half-blood extra light Ohio at 43½ cents; 6,000 lbs. half-blooded very light Ohio fleece, 43½ cents; 7,000 lbs. fancy fleeces, selected from the best clips in Ohio, at 61 cents; 8,000 lbs. half-blood Ohio fleece, 43 cents, 10,000 lbs. half-blood Ohio fleece, 42½ cents; 2,000 lbs. common Ohio at 36 cents.

Mr. Willard, of Boston, bought 10,000 lbs. one-quarter to one-half blood at 37½ cents; small lot of fleece, unwashed, at 27 cents; 2,500 lbs. tub-washed, mostly picked, at 43½ cents; 8,000 lbs. selected fleece at 51½ cents; 15,000 lbs. three-quarters blood at 47 cents; 7,000 lbs. one-fourth to one-half blood at 68 cents; 15,000 lbs. fancy clip at 54½ cents; 1,000 lbs. fancy clip at 55 cents; lot fancy clip at 60½ cents: 700 lbs. (took second premium), 55 cents; 250 lbs. lamb's fleece, from premium sheep, at 70 cents; two lots fancy clip at 57 cents; lot do. at 52½ cents; two lots do. at 54 cents; lot do. at 56½ cents; lot do. at 55 cents; lot do. at 57 cents.

Mr. Cooledge, of Boston, bought 4,000 lbs. mixed fleece, very light, at 39 cents; 13,000 lbs. three-quarters blood Ohio fleece at 46½ cents; 5,500 lbs. fine Ohio fleece at 46 cents.

Messrs. P. & H. Stearns, of Pittsfield, Mass., bought 2000 lbs. fine heavy wool at 30 cents; lot of fine and coarse mixed at 41½ cents; 5,000 lbs. three-quarters to full-blood Ohio at 47 cents; 10,000 lbs. one-half to three-quarters blood Ohio at 45 cents; 8,000 one-half blood, very clean and light, 37 cents; 12,000 full-blood Ohio, 50½ cents; 8,000 lbs. common to one-half blood Ohio, 38½ cents; lot fancy clip, 54½ cents; lot fancy clip, 52½ cents.

Mr. Sexton, of Cleveland, bought 4,000 of fancy clip at 46 cents.

Mr. H. Hill, of Milwaukie, bought 10,000 full-blood extra light Ohio at 46½ cents.

Mr. Matthews, of Painesville, bought 3,500 lbs. medium Ohio at 41½ cents; 8,000 lbs. choice Ohio, fine, at 49½ cents.

Mr. Randall, of Pittsburgh, bought 5,500 lbs. choice fine Ohio at 49 cents; four fleeces, extra nice, were run up to $1.15.

Mr. Bond bought 500 lbs., first premium, at 73 cents.

Mr. W. H. Ladd bought 600 lbs., from premium clip, two years old, at 55 cents; lot first premium fancy clip at 60 cents."

Quite a number of other parties were buyers in large amounts, the whole quantity sold being about 600,000 lbs., valued at $250,000.

So far as we can learn, the sale passed off to the satisfaction of all parties. Most of the sales were made direct to eastern manufacturers or their accredited agents. In every instance, the lots went off at an advance on the price estimated by wool-judges who were not in the market.

TEMPER. A Novel, by Miss Marryatt. Dick & Fitzgerald, 18 Ann-street, New York.

This story is an endeavor to show the evils of an ungovernable temper, and all the miseries attendant on an uncontrollable disposition. The story is excellent; the characters have the freshness of life about them, and they seem to be beings of flesh and blood, not made of the usual novelists' wax-work and fine apparel. The plot is simple, but interesting, and has the charm of being purely domestic. But the moral is not enforced, for the hero is such a good-hearted, kind and jolly creature that the reader likes him, despite his temper. In fact, one is rather inclined to think that his badness arises from the same source as his goodness, namely, a generous and impulsive disposition; and, although, in the novel, he kills his friend in a fit of temper, the reader does not experience that horror which such an awful event should create. The authoress, the daughter of the late Captain Marryatt, writes of men and their failings from a loving woman's point of view, and so makes us hardier wretches almost admire our own villianies because a woman finds an excuse for them. The work is well written, and every line is full of interest.

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FOREIGN SUMMARY—METALS AND MARKETS.

An immense factory for making the Armstrong rifled cannon, at Newcastle-on-Tyne, England, is nearly completed. It is to consist of five distinct shops; the first, 312 feet long and 80 feet wide, is to be devoted to forging with huge steam hammers. The foundry is already in operation, and the casting of one 70-pounder has been made. It is intended to arm the navy and the forts along the coast with such cannon at an early date.

To those who are skeptical of the immense power of compressed steam to cause great explosions, and who seek for some other agent, like electricity, to do this, the explosion of a blast-furnace, which lately took place at Hanley, will afford some convincing evidence that any compressed gas can produce equally as destructive effects. The engine which supplied this blast-furnace with hot air had stopped, and the valve to shut out the air from passing into the receiver would not act. The foul gas accumulated in the furnace, passed through the pipes into the receiver, and exploded with terrific effect, shattering the engine to pieces, and hurling the fragments to a distance of several hundred yards. The explosion was heard at a distance of three miles, and the loss of property caused by it amounts to £10,000.

From a return made to the House of Commons, it appears that 78,641 tuns of copper were imported into England last year, and 24,787 tuns of British copper exported. About 2,955 tuns of tin and 628 tuns of ore were imported; 2,327 tuns were exported; 23,725 tuns of spelter and zinc imported; 2,012 tuns of carbonate of zinc were imported, and 533 of the oxyd; 3,985 tuns of British zinc were exported; 14,139 tuns tuns of pig and sheet lead, and 2,316 of ore, were imported; 325 tuns of lead ore, 17,645 tuns of rolled and pig, 1,910 tuns of shot, 490 of litharge, 2,292 red lead, and 2,684 of white lead, were exported.

A bill has been introduced into the British Parliament for reforming the rates of fares at toll-bars, so as to reduce them for steam-carriages on common turnpike-roads. The preamble to the bill states that there is a probability of such carriages coming into more general use.

It is calculated by M. Carmal, a Prussian engineer, that there is as much coal in that kingdom as will suffice for consumption for nine centuries.

The new French floating-batteries are provided with movable platforms, which can be lowered down and taken up easily, to allow riflemen to stand upon them and be protected with movable shields.

The French rifled cannon (30-pounders) are bored with three grooves two inches wide and one-eighth of an inch deep, and make about a quarter of a turn from the breech to the muzzle; the twist is nearly uniform. About 30 of these are now being turned out per day. The bullets are conical, with feathers for the grooves. The range of these guns is five miles, and their accuracy wonderful.

In the new Louvre, Paris, a number of handsome bronze pillars support the lamps for illuminating the Place Napoleon III., and each of these pillars stands near the sidewalk and is furnished with a dolphin's head, out of which pours a stream of water for washing the pavement.

Two small steam sloops have lately been built in England for the Emperor of Russia.

In regard to the corn market, the Mark Lane *Express* states that the weather has been very changeable of late, and considerable damage has been done to the crops, and that there has been a slight rise in wheat. The effect of the storms on the potato crop could not yet be estimated, but the probability was a slight injury at most.

PRICES OF FOREIGN METALS, JULY 27.

	£	s.	d.		£	s.	d.
Staff. bar-iron, per tun..	8	0	0	Swedish steel, in faggot	21	0	0
Common English.....	7	0	0	Copper in tile,.....	107	10	0
Single sheet.....	9	10	0	British pig lead.....	22	15	0
Double sheet.....	11	0	0	Tin, block.....	129	0	0
Round nail rod.....	8	0	0	Bar.....	130	0	0
Square nail rod.....	9	0	0	Banca.....	134	0	0
Hoop iron.....	9	0	0	Plates (per box).....	1	19	0
Welsh iron rails.....	5	15	0	Spelter.....	19	0	0
Staffordshire pig-iron...	3	15	0	Zinc, in sheets.....	28	10	0
Scotch pig-iron.....	3	10	0	Copper sheathing, per lb	00	1	0
Swedish iron.....	18	0	0	Brass sheathing.....	00	0	10
Swedish steel.....	20	10	0				

The prominent change in the price of metals has been a considerable rise in pig-iron.

Rails have been more inquired after, and holders refuse to sell less than £6 and £6 5s. per tun for ordinary. The demand for Scotch pig-iron had increased for shipment; 10,000 tuns were forwarded the preceding week. Tin plates were rising. Lead was in good request, and spelter lively.

New York Markets.

COAL.—Foreign cannel, $9; Anthracite, from $4.50, $4.75, to $5.50

CORDAGE.—Manilla, 8¾c. a 8¾c. per lb.

COTTON.—The sales were more favorable this week, still the prices have somewhat fluctuated. Good ordinary Upland, Florida and Mobile, 10⅜c.; Texas, 11c.; Middling fair from $13¾c. to 14¼c.

COPPER.—There bas been a considerable advance in the rices of this metal. Lake Superior ingots at 23c. per lb. for cash; sheathing, 26c.

FLOUR.—There has been a slight upward tendency of prices. Southern flour has been buoyant, but on the whole, between one day and another, the market may be set down as fluctuating. Genesee brands, $5.25 a $8; Ohio choice, $5.50 a $7.75; common brands from $4.15 up to $6.

HEMP.—American undressed, $140 a $150; dressed from $190 a $210. Jute, $95 a $90. Italian scarce. Russian clean, $210 a $215. Manilla 6⅜c. a 6¾c. per lb.

INDIA-RUBBER.—Para, fine, 55c. a 57½c. per lb.; East India, 37c.

INDIGO.—Bengal, $1 a $1.65 per lb.; Manilla, good to prime, 55c. a $1.10; Guatemala, $1.05 a $1.25.

IRON.—Anthracite pig, $23 a $24 per tun; Scotch, $24 to $24.50; Swedish bar, ordinary sizes, $88 a $90; English refined, $53 a $54.50; English common, $43 a $45. Russian sheet, first quality, 11¼c. a 12c. per lb.; English, single, double and treble, 3⅜c. a 3⅞c.

LEAD.—Galena, $5.80 per 100 lbs.; German and English refined, $5.70; bar, sheet and pipe, from 6¼c. to 7c.

LEATHER.—Oak slaughter, light, 35c. a 37c. per lb.; Oak, heavy, 32c. a 35c.; Oak, crop, 40c. a 42c.; Hemlock, middle, 25½c. a 26½c. Hemlock, light, 25c. a 25½c.; Hemlock, heavy, 23¾c. a 24½c; Patent enameled, 16c. a 17c. per foot, light. Sheep, morocco finish, $7.50 a $8.50 per dozen. Calf-skins, oak, 62c. a 65c.; Hemlock, 60c. a 65c; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c.

NAILS.—Cut are quiet but steady at 3c. a 3¾c. er lb. American clinch sell in lots, as wanted, at 5c. a 6c.; wr ught foreign, 3c. a 3½c.; American horseshoe, 14½c.

OILS.—Linseed, city made, 60c. per gallon; whale, bleached spring, 54c. a 56c.; sperm, crude, $1.20 a $1.27; sperm, unbleached spring, $ 135; lard oil, No. 1 winter, 85c, a 90c.; extra refined rosin, 30c. a 40c.; machinery, 59c. a 100c.; camphene, 45c. a 47c.; coal, refined, from $1.12 a $1.50.

RESIN.—Common, $1.77½ per 310 lbs. bbl.; No. 2, &c., $1.80 a $2.12½; No. 1, per 280 lbs. bbl., $2.25 a $3; white, $3.25 a $4.50; pale, $4.50 a $6.25.

SPELTER.—5½c. per lb.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5½c.

TALLOW.—American prime, 10¾c, to 11c., p r lb.

TIN.—Banca, 34c. a 34½c.; Straits, 32c. a 32½c.; plates, $7.50 a $9.87½ a $10.08 per box. The holders of this metal seem not to be anxious to sell. Banca has still an upward tendency.

TURPENTINE,—Crude, $3.62½ per 280 lbs.; spirits, turpentine, 44½c. a 45½c. per gallon.

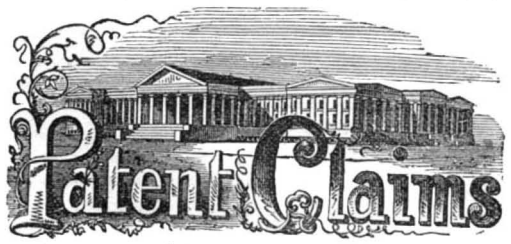
ZINC.—Sheets, 7½ a 7¾ per lb.

The foregoing rates indicate the state of the New York markets up to Aug. 11.

The following are the prices of printing cloths in Providence, R I. Market firm; goods very scarce:—5,000 pieces, 64 by 64, private terms; 11,000 pieces, 64 by 64, 5⅝c.; 4,000 pieces, 60 by 60, 5¾c.; 5,000 pieces, 60 by 64, 5 11-16c.; 5,000 pieces, 60 by 64, 5½c.; 3,000 pieces, 60 by 60, 5⅛c.; 4,000 pieces, 52 by 56, 5⅛c.; 3,000 pieces, 52 by 52, 5c.; 3,500 pieces, 48 by 52, 4⅞c.

The *Arabia's* news is rather more favorable for cotton. The Liverpool markets had been active during the week, and holders had sought for an advance, though without success. Trade at Manchester had also been more animated. The effect of the news here has not yet been tested. The markets have been dull for some time, but, with more favorable advices, would show renewed activity.

THE ERIE RAILROAD.—Judge Mitchell, to whom was entrusted the selection of a receiver for the Erie Railroad, has appointed Mr. Nathaniel Marsh to the position. Mr. Marsh has long been connected with the company as secretary. The appointment appears to give very general satisfaction, every one feeling assured that the affairs of the road will be managed economically and energetically, and above all, honestly. The bonds are for $150,000, and the sureties are to be Mr. Daniel Drew and Mr. Samuel Marsh. At the last meeting of the Directors a committee was appointed to devise some plan of reorganization. A feasible plan, one that will give satisfaction to all parties interested, is by no means easily arrived at. There are the second mortgage bondholders to be satisfied; back coupons to be settled, troublesome stockholders to be conciliated, and arrearages to employes (say $250,000) to be paid off. The work of the committee will be anything but pleasant. This process of "wiping out" the stock and some classes of the bonds must fall heavily upon many who in the early ages of railway investment deemed these securities the best in the market. Erie Railroad stock has sold as high as 95 cents on the dollar. We are acquainted with a gentleman in this city who is said to hold $250,000 of stock and bonds of the unfortunate corporation. There are many other railroads in our country that must sooner or later come to this same "lame and impotent conclusion." The evil day is fast approaching with many of them, and it astonishes us, in view of the almost desperate condition of this class of property, when we hear of parties taking stock in new enterprises of this character.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING AUGUST 9, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

24,978.—H. O. Ames, of New Orleans, La., for an Improvement in Apparatus for Heating Evaporating Pans:

I claim the arrangement of the parallel evaporating pipes, D D, with their elbows and collars and screw nozzles, a a, passing through the bottom of the pan, and the parallel external supply and escape pipes, B and C, with the nozzles, d d, and union couplings, l l, for making the connections with the nozzles, a a, substantially as described.

24,979.—John Andrews, of Clinton, Mass., for an Improvement in Seeding Machines:

I claim the arrangement and combination of the vibrating bars or blocks, g, frame, a, axle, d, cam, c, and seed slide, n, as set forth, whereby the cam which operates the harrow, also moves the seed slide, and the harrow bars, g, have a horizontal vibration, and also a vertical play with the frame upon the axle, d.

[This improved harrow is so constructed that it will, while harrowing the ground, sow grain at the same time.]

24,980.—John Andrews, of Clinton, Mass., for an Improvement in Seeding Machines:

I claim, first, The arrangement and combination of the blocks, b, circular plates, g, teeth, f, levers, u, and seed sliders, p, substantially as shown and described.

Second, The arrangement and combination of the covering apron, l, bar, d, blocks, b, rod, y, and lever, x, as shown and described.

[This harrow is for the same purpose as the preceding, but the end is arrived at by a different mechanical combination. Both are excellent inventions, but require illustrations to fully explain them.]

24,981.—Francis Armstrong, of New Orleans, La., for an Improvement in Brakes for Railroad Cars:

I claim making the adjustment from the pull, or the coupling, when actuating on distinctly detached parts, namely, the latch, c, and tongues, t, when constructed and operated as or substantially a described.

I also claim, in combination, the arms, n, bar, r, and levers, m, when arranged and operated substantially as described and for the purpose set forth.

24,982.—Moses S. Beach, of Brooklyn, N. Y., for an Improvement in Machinery to Feed Sheets of Paper to Printing Presses:

I claim, first, Feeding sheets to the impression cylinders of printing-presses by means of revolving arms, or scrapers, a, operating in combination with rollers, b, in the manner substantially as described.

Second, Retaining the paper in connection with the impression cylinders of printing-presses, during the process of printing, by means of holders, f and g', in the manner substantially as described.

Third, Detaching the paper from the impression cylinders by means of deflectors, p and q, operating substantially as described.

24,983.—G. W. Beard, of Canton, Miss., for an Improvement in Cotton Cultivators:

I claim the peculiar shape given to the scrapers or cutters, J J, and their lateral and vertical adjustment, in combination with the adjustable plow beams, C C, when the same are all arranged in the manner and for the purposes set forth.

[The nature of this invention consists in combining with two right and left turn-plows having their standards fixed in a laterally adjustable frame, peculiar shaped scrapers or cutters, which are made adustable both laterally and longitudinally on the moldboards of the plow, for acting on both sides of the ridge at a single operation.]

24,984.—E. P. Beauchamp, of Preston, Ga., for an Improvement in Cotton Seed Planters:

I claim the arrangement of the box 1, axle, 2, wheels, 3, side-pieces or frame, 4, bolt, 5, beam, 6, stock 7, follower, 8, furrow opener, 9, and brace, 10, as described, for the purposes set forth.

24,985.—Laurent Beaudreau, of Fond du Lac, Wis., for an Improved Shingle Machine:

I claim the relative arrangement, for united operation, of the intermediate circular revolving saw, B, open reciprocating double carriage, C, c c', toothed clamps, G G', bars, H H, rollers, m m', springs I I', inclined or curved guiding plates, n n', horizontal rocking cradles, J J, cams, r r', and S S', shafts, t t', bars, u, and hinged flaps or pawls, v v1 v2 v3, all substantially in the manner and for the purpose described.

[This improvement relates to that class of shingle machines in which the bolt or block lying inclined is fed up to a circular revolving saw, and in which, after the shingle is cut from the block, the latter previous to its next feed is automatically released from the grippers and tipped in a reverse direction and griped to effect a succeeding cut, and so on until the whole bolt is cut up. By this invention one saw operates in the above manner on two blocks or bolts.]

24,986.—Philip Bettle, of London, England, for an Improvement in Watch-cases. Patented in England Nov. 18, 1857:

I claim, first, The attachment of the inner case containing the movement of the outer case, by means of pins or pivots, so that the movement case can be turned over, to face the open or closed side of the outer case without being removed from the outer case.

Second, Attaching the pendant handle to the movement case, so that it forms one of the centers or pivots, on which the watch turns in connection and combination with a pin or pivot on the opposite side of the case.

Third, The particular form and manner of constructing the pendant, and attaching the same to the inner or movement case before described and shown.

24,987.—Wm. Billinghurst, of Rochester, N. Y., for a Fishing Reel:

I claim the combination, of the skeleton ring, R R R, with the other parts of the reel, the whole being arranged in the manner and for the purpose substantially as set forth.

24,988.—Edmond Blanchard, of Greenfield Mills, Md., for an Improvement in Composts:

I claim, as a new article of manufacture, a fertilizing compost, composed of lime, chlorkle of sodium, wood ashes, charcoal, wheat

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bran, chimney soot and gypstm, combined in the proportious and manner described.

[By a judicious mixture of lime, common salt, wood ashes, charcoal, wheat bran, chimney soot and plaster (gypsum) a very superior compost is obtained, onethat possesses all the essential properties that the soil requires for the raising of wheat and other cerials, and although its cost is but one-fourth of guano, by experiment it has been proved that it will produce a heavier crop.]

24,989.—E. Burroughs, of Rochester, N. Y., for an Improvement in Machin s for Cutting Paper:

I claim, first, The employment or use of the reciprocating and oscillating knife, G, when arranged to operate, substantially as and for the purpose set forth.

Second, The knife, G, in connection with the cone of pulleys, T, attached to the shaft, S, thc hollow shafts, y z, with their respective gear ng, a' h' h', and a'' i' j,' and the shaft, R, with its gearing, v w, and the racks, I I, attached to the knife-bar, F, by the rods, H H, the whole being arranged to operate substantially as set forth.

Third, The arrangement of the shaft U, with spring, g', the arm, f, cone of pulleys, T, levers, V W rack, l', substantially as shown, for the purpose of automatically changing the movement of the knife from a descending to an upward movement.

Fourth, The clamp formed of the vertical and horizontal plates, p q, when arranged as shown, soas to be adjusted by the screw, s, and pinion, or worm wheel, r, pinions, u u, and racks, P P, the latter serving in the capacity of both racks and guides, substantially as and for the purpose specified.

Fifth, Attaching to the shaft, F, an index, b, arranged to move over a graduated stationary plate, c, attached to the frame, A, substantially as shown, for the purpose of enabling the operator to accurately adjust the paper beneath the knife.

24,990.—J. T. Campbell, of Rockville, Ind., for an Improved Adding Machine:

I claim the arrangement of a series of wheels provided with ten cogs or teeth, and carrying the ten numeric figures on their outward faces, in combination with the stationary plate containing like numeric figures arranged on the circle, surrounding each of the wheels in the series, substantially as described.

And in combination with the parts above claimed, arranged as described, I claim the stop-bars, Y Y, and spring slides, G G, and oscillating arms or pawls, F F, with the cam, e e, the whole being constructed and arranged for joint operation, substantially as set forth.

24,991.—Walter Clark, of Palmyra, Ill., for Improvement in Seed Planters:

I claim the arrangement of the reciprocating agitating rod, r, when passing through the adjustable seed discharge opening in the side of the hopper, with the frame, F, wheels, W, pins, P, teeth, a b c, hopper, H, and adjustable slide, S, the whole being constructed as and for the purpose set forth.

24,992.—W. Cogswell and C. A. Mathewson, of Ottawa, Ill., for an Improvement in Corn Harvesters:

We claim the circular cutter, F, and the reciprocating sickle, r, with its stationary toothed plate, s, in connection with movable bed, or fingers, I, the whole being placed on a mounted frame, and arranged for joint operation substantially as and for the purpose set forth.

[In this machine a rotary and reciprocating cutter and a movable bed are employed; they are mounted on a frame, so that as the machineis drawnalong, the standing cane or corn will be cut and deposited in proper sized gavels on the earth.]

24,993.—J. P. Coonley, of Farmington, Mich., for an Improvement in Corn Planters:

I claim the arrangement of seeding-roller, H, gear wheels, d d, slide plate, I, lever, c, adjustable teeth, E, coverers, F, and tracking gage, M, constructed and operated substantially as and for the purposes set forth.

24,994.—B. T. Currier, of Bath, Maine, for an Improvement in Corn Harvesters:

I claim the arrangement and combination of the scythe-shaped cutters, B' B', rods, D D', cranks, E E', adjustable frame, J, and standards, A, as and for the purposes shown and described.

[Peculiar shaped cutters which perform the twofold purpose of gathering and cutting the stalk, and holding it firmly between the knives while in the act of cutting are arranged in front of the machine, and constitute the invention.]

24,995.—Edward Davidson, of Batesville, Ark., for an Improvement in Hoop Fastenings for Cotton Bales.

I claim forming the socket of two parts to admit of the same being opened to receive the bent or doubled and lapped ends of the bale hoop, and closed to secure the ends of the hoop together, substantially as and for the purpose specified.

[An engraving and description of this invention will be found on another page.]

24,996.—Alva G. De Wolfe, of Seymour, Conn., for an Improvement in Vulcanized Gums:

I claim the use of pulverized, vulcanized rubber, gutta-percha, or other vulcanized gum, in the manner and for the purpose specified.

24,997.—C. S. Dickinson, of Cleveland, Ohio, for an Improved Centrifugal Gun:

I claim, first, The employment of lever, C, provided with a collar which surrounds shaft, B, pivoted or hinged at x, and provided with a pin, or rod, L, when the same is used, substantially as and for the purpose specified.

Second, Operating lever, C, in one direction, by means of rod, D, and its connections through the center of the shaft, B, and in the other direction by means of spring, F, for the purpose of discharging the balls from the barrel at the proper time, substantially as set forth.

24,998.—Rudolph Dirks, of Philadelphia, Pa., for an Improvement in Seats for Sleeping Cars:

I claim, first, The cushioned platform, E, and the frame, F, with its detachable cushion, f, and movable legs, h, in combination with the permanent partitions, D D, the said platform and frame being hinged together and otherwise arranged as set forth.

Second, The boards, G and K, adapted to and sliding in or against the partitions, D D, and arranged as specified, so as to form the foot and head-boards for the couches.

Third, The frame, H, as hinged to the side of the car and the frame I, so hinged to the frame, H, that both frames may assume the positions illustrated in Figs. 1 and 2, in combination with the partitions, D D, and their sliding frames, G,

Fourth, Forming the upper couch of the board, L, hinged to the side of the car, and one or more boards, M, hinged to the board, L, when arranged as set forth, in combination with the permanent partitions, D D.

24,999.—Zachariah Feagan, of Palmyra, Mo., for an Improvement in Hemp-brakes:

I claim the arrangement and combination of the stationary bars, L L, finger guards, O O, vibrating spring levers, E E, and cams, D D, the whole being constructed and operated substantially in the manner and for the purpose set forth.

25,000.—Andrew Dougherty, of Brooklyn, N. Y., for an Improvement in Printing-presses:

I claim the combination of the inking apparatus at the side of the main cylinder of a press, with a carriage that can be moved from and towards the main cylinder, and with a stop that controls the position of the carriage; the combination, as a whole, operating substantially as set forth.

25,001.—Albert Eames, of Bridgeport, Conn., for an Improved Die for Swaging Bolt-heads:

I claim making dies for swaging bolt-heads and other articles in two or more parts, the parts forming the bottom being fitted to and in the part forming the periphery, substantially as desc ibed, and the whole fitted to and secured withi the drop, or equivalent therefor, as set fort .

And I also claim, in comb nation with the die, the bottom of which is made separate from and inserted in the part forming the periphery, grooving the periphery of the part forming the bottom for the escape of air, substantially as described.

25,002.—J. P. Emswiler, of Knight's Tower, Ind., for an Improvement in Sewing Machines:

I claim the combination of the slide, M, or its equivalent, arranged substantially as described, with the feeding mechanism, for the purpose of adjusting the bed to the feeding mechanism for materials of various thicknesses, without changing the position of the feeding mechanism.

And I also claim, in combination with the bobbin, arranged as described, to vibrate on the shuttle, the longitudinal arched pressure spring, arranged substantially as described for the purpose set forth.

25,003.—Moses G. Farmer, of Salem, Mass., for an Improvement in Windlasses:

I claim the combination of the roller, A, the ratchet wheel, B, the retaining ratchet, F, and the actuating ratchet, D, with the lever, C, and toggle-joint, E, so arranged that the thrusting power of the toggle-joint, E, shall be wholly exhausted, when the lever, C, is fully depressed, and the joint, E, brought into a straight line which intersects the axis, l, and the point of the actuating ratchet which is in contact with a tooth of the wheel, B.

I claim the means described of permitting the backward motion of the roller, A, viz., by causing the motion of the lever, C, to release, alternately, the actuating and retaining ratchets through the agency of such means as the springs, K, the projecting arms, L M, and the proper position of the collar, J, substantially as described.

25,004.—C. N. Farr, of Philadelphia, Pa., for an Improvement in Sewing Machines:

I claim the arrangement of the fulcrum slide, r, stops, q and s, and looping bar, p, for regulating and adjusting the motions of the looper, as set ferth.

And in combination with said looping-bar, adjusted as described, I claim the rocking lever, o, fitting and acting as specified.

25,005.—Benaiah Fitts, of Worcester, Mass., for an Improvement in Governor Valves:

I claim the manner of mounting the valve, substantially as described, that is to say, resting or supporting the valve, as shown at M, and retaining it into its seat, as shown at N, for the purposes set forth.

25,006.—Perley F. Freeland, of Newark, Ill. (assignor to V. R. David, of Morris, Ill.), for an Improvement in Cultivators:

I claim the arrangement of the tongue, A, curved or segurent bar, B, beams, E E, with screw-rod, c, and pendants, d', and shares, F, attached, substantially as and for the purpose set forth.

[The object of this invention is to obtain a cultivator which may be made to answer equally as well for eradicating weeds and pulverizing the soil, and for hilling or earthing-up plants. In short, an implement that may be used for general work in the cultivation of what are generally termed "hoed crops," or such as are grown in hills or drills.]

25,007.—Edwin Gomez, of New York City, for an Apparatus for Folding or Wrapping Papers:

I claim the folders, f f, formed with the lips, 44, and volutes, 3 3, in combination with the intermediate twisters, i i, in the manner and for the purposes specified,

25,008.—Geo. P. Gordon and F. O. Degener, of New York City, for an Improvement in Printing-presses:

We claim, first, Combining with the tympan-frame the sheet-holding and relieving-nippers or grippers, for the purpose of holding he sheet, and for relieving the sheet from the type.

Second, We claim the combination of a cylinder, or segment of a cylinder, with its wheel-bearers, the impression cylinder, roller-pendants, and the racks or gearing.

Third, We claim the frictionless-roller, or its equivalent, in combination with the tympan-frame, for the purpose of closing the tympan and properly laying the sheet upon the form in advance of the passage of the impression cylinder or its equivalent.

Fourth, We claim operating the sheet-holding and relieving-grippers by or through the motion of the tympan.

Fifth, We claim attaching a tympan-frame to an adjustable bed in such a manner that they, at all times, shall retain their relative positions towards each other, in the manner described.

Sixth, We claim hanging, hinging or attaching the inking-apparatus to the frame of the press, or to the press, in such a manner that it may be turned, swung, or set aside, so as to allow the workman to get at the form to make any necessary alterations, or to make the form ready, or for the purpose of using the bed as a composing-stone.

25,009.—Ralph Greenwood, of Altoona, Pa., for an Improvement in Fire-boxes of Locomotive-engines:

I claim the midfeather, C, when used in connection with a gas chamber, D, and fire-box, A, provided w th openings, e f g h, the parts being arranged relatively with each other to operate substantia lly as and for the purpose set forth.

I further claim the cylinders, E F, when applied to the orifices of the gas chamber and fire-box, and connected by a lever, G, to operate simultaneously as and for the purpose set forth.

25,010.—Leonard B. Griswold, of Pennfield, N. Y., for an Improvement in Potato-diggers:

I claim the employment of a rotating head or disk, having teeth or spurs arranged around an upright shaft in a direction oblique to the axis thereof, in combination with the truck, B, and driving-wheels, G F, or their equivalents, for giving the required motion, substantially as and for the purpose set forth.

25,011.—W. D. Harrah and B. S. Baldwin, of Davenport, Iowa, for an Improvement in Seed-planters:

We claim, first, The combination and arrangement of the peculiarly-constructed hopper, F f' f'' f''', regulating-plate, G, sliding frame, H, slides, h'', pitmans, b, edged leading-wheels, B, hinged seed-tubes, I, rooved covering-wheels, C C, foot-lever, J, caster-wheel, D, and hand-lever, K, all substantially as and for the purpose described.

Second, In combination with the hopper, F, the arrangement of the foot-lever, J, and hinged bar, i, when the latter is so hinged as to throw the points of the seed-tube forward in their adjustment, or when the foot-lever is depressed, substantially as and for the purpose described.

25,012.—Robert S. Harris, of Galena, Ill., for an Improved Water-gage for Steam-boilers:

I claim the within-specified manner of constructing and attaching the float-stem to the boiler, whereby it is made to answer for carrying the float and as an index for indicating the hight of the water in the boiler, and, if desirable, as a trip for opening a valve for an alarm whistle, all in the manner and for the purpose described.

25,013.—James Harrison, Jr., of New York City, for an Improvement in Sewing-machines:

I claim, first, The switching-lever, n, constructed and operated as set forth, for directing the thread to the beard or barb of the needle, and preventing the escape of the thread therefrom.

Second, I claim controlling the feed and the stitch by the raising or lowering of the needle as set forth.

Third, I claim rotating the needle, and carrying with it the thread, thus forming a twisted threaded-loop, as described.

25,014.—George A. Hay, of Berea, Ohio, for an Improved Machine for Cutting-out Wooden-ware:

I claim the rock-shaft, K, in combination with the hoop-saw, H, constructed and arranged as described, and operated by means of the pinion, L, in the manner and for the purpose substantially as set forth.

25,015.—James Haynes, of Hollis, Maine, for an Im-Wood Saw-frame:

I claim the inclined plane, ratchet and the nipper or strainer, applied to the saw and frame, as described and represented in the drawing accompanying these specifications.

25,016.—Stanislas Hoga, Wm. P. Piggott and Septimus Beardmore, of Middlesex county, England, for an Improved Mode of Generating and Applying Electric Currents in Telegraphing:

We claim the ap lication to telegraphic instruments of currents of electricity, produced from metals or substances arranged in the earth, or in natural bodies of water, in the manner and for the prop rties and relations described.

25,017.—Robert Hooper, of Baltimore, Md., for an Improvement in Steam-boilers:

I claim, first, Contracting that part of the boiler immediately above the fire-flues, in combination with the widening and extending of that part which is beyond or in the rear, and above the end of the fire-box, substantially as and for the purposes set forth.

Second, Forming a water-circulating passage below in rear and above the fi e-box, and nearly or wholly isolating said passage from the fire-box, by means of a large space existing between the fire-box and the partition walls of the said water-circulating passage, substantially as and for the purposes set forth.

25,018.—Anthony Iske, of Lancaster, and Jacob B. Erb, of Conestoga township, Pa., for an Improved Approach-opening Gate:

We claim the arrangement of the platforms, G, uprights, H, to the lever, J, with the connecting-rod, K, attached to the arm, O, on the slat, Q; the groove, b, on the inside of the post, B, for operating a series of cross-slats, connected by pivots with the slats, Q R, as shown, when combined, in the manner set forth, or substantially the same.

25,019.—John W. Kingman, of Dover, N. H., for an Improvement in Machines for Milking Cows:

I claim the teat-cups or tubes, partially covered at their upper ends, with an elastic flange, substantially as described, which will yield for the insertion of the teat, and gripe it so as to hold the cup u on the teat during the process of milking, and form a packing between the edge of the cup and the teat, which will be pressed against the teat by the external air when the internal air is exhausted; and, in combination with the device above-claimed, I claim a vessel provided with an air-pump, and connected with said cup or cups by flexible tubes, so arranged as to exhaust the air and draw the milk from the cow or other animal, substantially in the manner described.

25,020.—Ebenezer A. Lester, of Boston, Mass., for an Improvement in Railroad Car-wheels:

I claim attaching the wheel, D, to its axle, by means of the auxiliary hub, E, with its recess, f, and groove, e, and the segmental ring, H, or its equivalent, connected with the wheel in the manner substantially as set forth.

25,021.—Theodore Lipshuts and Daniel C. Jones, of Ballston Spa, N. Y., for a Self-acting Battery for Scaring Crows, &c.:

We claim the rising and falling box, K, arranged with the slide, g, and apertures, p, and operating in combination with the dog, J, and pulley, E, substantially in the manner and for the purposes specified.

[The object of th s invention is to arrange a battery with a number of chambers, in connection with a gun-barrel, in such a manner that its chambers, one after another, are made to go off at regular intervals without the aid of man, and, by these reports, frighten away injurious animals, and the invention consists in arranging a rising and falling box in such relation to a revolving battery, that when the box is filled with sand it sinks down and causes a hammer to discharge one of the chambers of the battery, and the box is so arranged that it discharges the sand when it reaches the ground, and it is raised by weights ready for a new charge.]

25,022.—Samuel W. Lowe, of Philadelphia, Pa., for an Improvement in Machines for Milking Cows:

I claim the cup, A, with the perforated diaphragm, B, when constructed as described, to receive all the teats of the cow's bag, by having an opening in the diaphragm for each teat and combined with an exhausting apparatus, constructed substantially as described and for the purpose set forth.

25,023.—Moses Marshall, of Lowell, Mass., for an Improved Device for Making Electro-magnetic Currents Constant or Intermittent:

I claim the spring, g, so constructed and arranged as to be insulated from or connected to the two ends of the helical wires by springs, l and k, or otherwise, essentially in the manner and for the purposes fully set forth.

25,024.—W. McElwee, of Shelbyville, Ind., for an Improved Kitchen Safe:

I claim the combination and arrangement of hollow posts, B, with water-cups, D, arranged in the manner and for the purpose specified.

[The body of this safe is mounted on hollow posts, extending from the floor to the top of the safe, and they are provided with water cups near the bottom of each leg, which are connected by perforations with the compartments of the safe, so that cool ir is always supplied to the safe without making perforations in its sides.]

25,025.—E. McKenney, of Montgomery, Ohio, for an Improvement in Seeding-machines:

I claim the arrangement and combination of the distributing disks, L, levers, N, check-valves, q, and buttons, u, to operate together with the hammer, o, and with the bell, M, substantially as and for the purposes set forth.

[With this machine the corn or seed can be deposited in hills at different distances apart, and the time when the check-valve opens, and when the corn is deposited in the ground, is indicated by a hammer striking on a bell, so that the operator is enabled to plant his seed in check rows to enable it to be plowed both ways, and there are other contrivances to render it an efficient and good seeding- achine.]

25,026.—J. B. McMillan, of Tipton, Ind., for an Improvement in Seed-planters:

I claim the planting and covering apparatus, when constructed and arranged in the manner and for the purposes set forth.

25,027,—Adam Miller, of Mt. Pleasant, Iowa, for an Improvement in Underground Draining Machine:

I claim the combination and arrangement of the mole with the drain-protectors, as described, for the purpose of expeditiously and economically giving protection to the upper part of the ditch, and of disengaging the protectors from the mole plow with facility after they are laid.

25,028.—Alex. Miller, of Newbern, N. C., or an Improvement in Drivers for Millstones:

I claim the employmeat or use of the friction rollers, B B, applied to the driver, A, in connection with the plates, C C, or their equiva

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lents, fitted in the recesses adjoining the eye of the stone or runner, for the purpose of forming proper bearing surfaces for the rollers—the whole being arranged substantially as and for the purpose set forth.

[The object of this invention is to reduce the friction attending the rotating of the stone, by the driver, when the former is unsteady, from its unbalanced state or from an untrue position of the spindle, The invention consists in having a friction roller attached to each end of the driver on opposite sides, and having steel plates fitted in the eye of the stone to form durable and plane bearing surfaces for the rollers.]

25,029.—Saml. C. Moore, of Providence, R. I., for an Improvement in Hoops for Skeleton Skirts:

I claim the corrugated sheet metal hoop for ladies' skirts described, as a new article of manufacture.

25,030.—Oliver P. Moran, of Haynesville, Mo., for an Improved Device for holding together the Panels or Portable Fences:

I claim the arrangement of the notched projections or projecting pieces of the upper and lower rails in combination with the right-angled notches, i i, in the end battens, substantially in the manner and for the purpose specified.

25,031.—Saml. Mowry, of Womelsdorf, Pa., for an Improvement in Cultivators:

I claim the arrangement of the axles, P3, wheels, B, stretch-bars, L, levers, H I and L3, frames, M, wheel, C, ratchet bar J, and cultivator bar, P; the whole being constructed as described and set forth.

25,032.—A. A. Mess, of Philadelphia, Pa., for an Improvement in Hydro-carbon Vapor Apparatus:

I claim the steam generator, A, and dryer, E, in combination with a distinct hydro-carbon vaporizer, C, the same being also connected with the retort, D, and the whole arranged together so as to generate the steam and hydro-carbon vapor separately, and for their subsequently mingling and combination, substantially in the manner and for the purpose described.

25,033.—Matthew Mitchell, of Alton, Ill., for an Improvement in Corn-planters:

I claim the arrangement of the frame, B, seats, E and G, hoppers, H, shoes, S, and cutters, N, with the device for operating them, in combination with the frame, K, hung on the axle, D, and with the slides operated as described—the whole being constructed and arranged substantially in the manner and for the purposes set forth.

[This planter is designed to plant seed in sod ground by cutting through and depositing the seed underneath the sod, or it may be applied to planting in old and mellow ground.]

25,034.—Don J. Mozart, of Yellow Springs, Ohio, for an Improved Arrangement of Dead-beat Escapement:

I claim the improved arrangement of the double "scapers," G G, with the star scape-wheel, E, or its equivalent, substantially as and for the purpose specified.

25,035.—Edward Norton, of Boston, Mass., or an Improvement in Skates:

I claim the metal straps, D and E, and the slotted plates, J, and screw, G, for tightening the skate to the foot, substantially as shown.

[This invention consists in making the sole-plate, or what is more generally called the stock of the skate, of metal, and in two detached parts, and in pivoting them respectively to the heel and front parts of the runner, and in connection with a skate thus made, in making the heel and toe straps for securing the skate to the foot of sheet metal, which are secured tightly to the foot by a peculiar fastening.]

25,036.—Marcus P. Norton, of Troy, N. Y., for an Improvement in Postmarking Stamps:

I claim the blotter, J, connected or attached to the main part of any "post-office post-marking stamp," for the purpose of cutting and inking, blotting and effacing, so as to successfully cancel the frank or postage stamp of any letter or any package, at the same time and operation of marking upon such letter or package the name of any post-office, the year, the month and the day of the month, substantially as and for the purpose set forth.

25,037.—Leonard Packard, of Galesburg, Ill., for an Improvement in Cultivators:

I claim the arrangement of the beams, P, the irons, Z Z′, and the projection, X, on the ends of the beams, the adjustable arms, S, braces, W, blades, T, lifting rods, 1, adjusting bar, 3, levers, 5, fulcrum, 6, and hinged pole, L, as described, for the purposes set forth.

25,038.—J. J. Parker, of Marietta, Ohio, for an Improved Egg-beater, or Churn:

I claim the tube, A, in combination with the band, C, and grated bottom, M—all constructed, arranged and operating substantially in the manner described.

25,039.—Horace Parkhurst, of De Kalb, Ill., for an Improved Clothes-frame:

I claim the combination and arrangement of the standards, A, the rails, B, the head-blocks, C, the c asps, E, the cords, F, substantially as and for the purpose specified.

25,040.—Dubois D. Parmelee, of New York City, assignor to J. A. Greene, of Beverly, Mass., for an Improvement in Mode of Uniting Solid Substances:

I claim the method and process described of uniting various substances or bodies of the same or different character and properties, by the interposition between the surfaces of said substances or bodies to be united, of one or more sheets or layers of india-rubber and gutta-percha, seperately, or when combined with the substances, such sheets or layers having previously been treated in the manner described, to produce the change specified; whereby, on completion of said change, a water-proof cement is obtained, which, while it possesses the requisite r gidity and coherence to keep the bodies firmly and strongly united, possesses a sufficient degree of elasticity to compensate for the expansion or contraction of the fibers of the bodies for the purposes substantially as set forth.

25,041.—Lawson G. Peel, of Webster county, Ga., for an Improvement in Corn-planters:

I c aim the arrangement of the beam, F, stock. E, frame, D, bolt, a, hopper, A, wheel, B, and cylinder, C, as described, for the purposes set forth.

25,042.—Colwell P. Pool, of New Market, Ala., for an Improvement in Filing Cotton-gin Saws:

I claim the arrangement of the file-case, B, with the file-holder, b, and sleeves, b,, to operate in combination with the bar, C, and with the slide, E, and ridge, e′, substantially in the manner and for the purpose specified.

A series of files, in suitable sockets, are arranged in such a manner that a reciprocating as well as an oscillating motion can be given to the files, and that when the same are brought in the proper relation to the saws of a gin cylinder, the teeth of the several saws may be scored by one and the same operation, and also whetted and rounded, so that it is not necessary to go through the same operation for every single saw.

25,043.—Wm. F. Pratt, of Bristol, Pa., for an Improvement in Sewing Machines:

I claim the construction of the thread-case with an angular projection, j, extending across its center, and the construction of the sliding-ring or its equivalent, with a similar angular projection, l, fitting to the said projection, j, as described, and operating in combination therewith in the manner substantially as specified, not only to prevent the twining of the thread-case, but to check and control the loops in their passage over said case, thereby avoiding the use of separate thread-controlling apparatus.

25,044.—S. M. Quimby, A. H. Brown, G. H. Renton and James Criswell, of Newark, N. J., for an Improved Furnace for Making Iron direct from the Ore:

We claim the arch, K, the hopper-damper, E, the rods or bars, o o o o, arra ged and operated substantially as described in the drawings.

We also claim the dampers at the bottom of the tubes for discharging one or more tubes at the same time into one box or hopper, as shown.

25,045.—John B. Read, of Cold Spring, N. Y., for an Improvement in Apparatus for Tanning:

I claim an improved apparatus for tanning and other purposes; said apparatus consisting of one or anumber of smooth porous or perforated surfaces of wood, or other fixed material, placed singly or in succession in open or closed vats or vessels, or arranged in pairs so as to form closed hollow cases, upon which skins or other substances to be operated upon are to be smoothly stretched, and then the tannin or other fluids forced through them by hydrostatic or other pressure into the interior, whence means of escape are provided, as described.

I claim also the use of tarpaulin sheet metal, or other water-proof substances in form of sheets, to cover over the perforated parts of the cases not overlaid by the skins, &c., that the fluids used may be afforded no passage except by percolating through the skins, &c.

25,046.—Chas. A. Robbe, of Augusta, Ga., for an Improvement in Gas Retorts:

I claim a gas-generating chamber of a retort, made in two parts, when the said parts are constructed so as to lock together and form a tight joint by the simple act of sliding one portion into gear with the other, substantially as set forth.

25,047.—Theodore B. Rogers, of Wethersfield, Conn., for an Improvement in Seed-planters:

I claim the arrangement of slides, I I′ I″, lever, L, former, G, floats, H, adjustable pins, E, and markers, R, as described, for the purpose set forth.

25,048.—James Rue, of Englishtown, N. J., for an Improvement in Cultivators:

I claim the arrangement of the loose draft pole, G, bracket, f, cultivator frame, B H, hinged rods, a b′, devices, i j k, bracket, d, and pin, e, all arranged and operating substantially in the manner and for the purposes described.

[This cultivator belongs to that class of plows which are intended for hilling and weeding corn, potatoes, tobacco, cotton, and all other sorts of root crops, and which are made to straddle the rows or hills, so that the plants pass between the shares and the draft animals, and under the draft pole, which is raised high enough to pass over the tops of the growing crops, and which is attached to a cross-bar that is attached to the necks of the draft animals. The invention consists in attaching the draft pole to the beams by means of hinged rods, which connect with the pole at a point above the pin to which the draft animals are hitched, so that any strain exerted on that pin has a tendency to depress the rear end of the draft pole and to raise its front end, whereby the plow-shares are kept down to the ground without any extra exertion of either driver or animals, and as the pole is connected by hinged rods without any rigid fastening, the driver is enabled to accommodate the action of the shares to the inequalities of the ground, and at the same time the front ends of the shares can be raised and the cultivator drawn from place to place.]

25,049.—Ezra D. Sargent, of Indianapolis, Ind., for an Improvement in Seats and Couches for Railroad Cars:

I claim, first, The side lounge, G, or nurse couch, constructed and arranged as and for the purpose set forth. And,

Second, Its combination with the backs, a L M, seats, F G H J, partitions, P, brackets, Z, and stops, V; all arranged, constructed and operated substantially as set forth in the specification.

25,050.—John Shaefer, of Lancaster, Pa., for an Improvement in Grinding-cylinders for Apple Mills:

I claim the tangential, curved, longitudinal, toothed cylinders, A B, as set forth and described.

25,051.—John P. Sherwood, of Fort Edward, N. Y., for an Improvement in Nail Plate-feeders:

I claim the employment of the stationary inclined plane, N, and the tumbler, O, having an inclined face, k, in combination with the arms, m m′, of the hollow shaft, P, of the plateholder, and with the feed-screw and nut, and the driving cam, D, or their equivalent—the whole operating together substantially as described to produce the several movements specified.

25,052.—Evan Skelly, of Plaquemine, La., for an Improvement in Apparatus for Heating Evaporating Pans:

I claim the employment, in an evaporating pan, of a conical steam heater, with a central opening and a passage around its exterior and under its bottom, substantially as described,

25,053.—N. B. Slayton, of Madison, Ind., for an Improvement in Securing Artificial Teeth:

I claim, first, Securing artificial teeth on plates of gold or silver, by means of an amalgam of gold or silver, or both, combined with mercury, substantially as described, for the purposes set forth.

Second, I claim forming, by means of said amalgam, an outer flange or rim, a, covering and supporting the base of the teeth, substantially as and for the purpose set forth.

25,054.—Solomon P. Smith, of Crescent, N. Y., for an Improvement in Straw-cutters:

I claim the arrangement of a crank shaft, M, pitman, N, knee-jointed lever, F, knife, C, with a straw box, B, and cutter block, D, for conjoint use, as specified and shown by the drawings.

25,055.—Abel Spencer, Jr., of Southport, N. Y., for an Improved Mortising Machine:

I claim the frame made with cross-heads connected together by means of the jointed rods, J J, and having those rods jointed at or nearly in line with the cutting edge of the chisel, and the mode of applying or using it, or any other manner substantially the same.

25,056.—La Fayette Stevens, of Elmira, N. Y., for an Improved Machine for Tenoning Blind Slats:

I claim constructing the cutter-head with grooved cheeks, f, clamping nuts, k, and bearing studs, j, whereby the plane cutter knives, g, are held in an oblique position with the plane of rotation with the cutting edge of the operating one, terminating in conjunction with that of the hollow hub, h, and shoulder, e; arranged and operating substantially as and for the purposes set forth.

I also claim the combination and arrangement of the rest, K, with stationary and movable upper and lower jaws, o p, and gage, q, substantially in the manner and for the purpose described.

I further claim the arrangement of devices for gaging the length of the slat, consisting of the automatic stop bolt, t, as operated by inclined plane, u, and lever, v, to cause the carriage to stop alternately at the fixed stop-gages, s and w, substantially as described.

25,057.—Stephen Stewart, of Philadelphia, Pa., for a Burglars' Alarm:

I claim the combination of the several parts, A B C D E F G H I J K L M N and O, as described and arranged to operate substantially as and for the purposes set forth.

25,058.—Wm. A. Suddith and John F. Suddith, of Charlestown, Va., for an Improved Washing Machine:

We claim the hinged part of cylinder as set forth in drawing at Fig. 7.

25,059.—Geo. S. Tapley, of Bristol, Conn., for an Improvement in Sewing Machines:

I claim the movable cup, g, and its appendages, for griping and automatically releasing the shuttle at intervals substantially as specified.

I also claim the construction and arrangement of the feed apparatus as and for the purpose set forth.

25,060.—Horace Trumbull, of Jersey City, N. J., for an Improvement in Machines for Washing and Separating Ores after being Pulverized:

I claim the application to a rotary buddle or table such as described of vibrating brushes, when the same are arranged and operated essentially as specified.

[This invention relates to an improvement in washing and separating pulverized ores and other substances, and for treating ores of zinc, or any pulverized ores or minerals, where machinery known as the rotating buddle or table is used. It consists in arranging upon suitable frames, to all of which an oscillating motion is given, brushes, so pivoted to the frames that they will press upon the surface of the table or buddle with just sufficient gravity to keep the ore in constant agitation without scraping or wiping it into heaps and retarding its passage over the tables, as is the case with the revolving or fi ed brushes; and also in giving to these brushes a greater speed than that of the buddle, which is to be determined by the consistency or quality of the ores to be subjected to the separating process.]

25,061.—Otis Tufts, of Boston, Mass., for an Improvement in Elevators or Hoisting Apparatus for Hotels, &c.:

I claim, first, For the purposes of elevating, the combination of the screw and the passenger car or platform.

Second, I claim the construction of a screw for elevating having stays or bearers at intervals, attached to the wall of a building or any fixed adjacent structere.

Third, I claim the construction of a nut with a slot or opening in the back or side to enable it to pass by the bearings or stays before referred to and as described.

Fourth, I claim constructing a nut or carriage with wheels or rollers running upon the thread of the screw substantially as described.

Fifth, I claim controlling the descending motion of elevators or hoisting apparatus by means of fluid retarders, constructed substantially as described.

Sixth, I claim regulating the action of fluid retarders by means of a fly-ball governor or its equivalent, substantially as described.

Seventh, I claim the construction, arrangement and operation of passenger cars of an elevator or hoisting apparatus substantially as described; that is, providing the platform with side walls and doors or gates, said doors or gates being combined with suitable mechanism arranged in relation to stationary cams or projections on the gallery floors, or any contiguous parts of the building so as to open and close automatically in the manner and for the purposes substantially as set forth.

Eighth, I claim opening and closing the doors of the galleries or landings automatically, by means of cams or projections on the car through a system of compound or multiplying levers, constructed and arranged substantially as described, and for the objects set forth.

Ninth, I claim fastening and unfastening automatically the doors or gates of the car, by spring latches or their equivalents, operated by cams or projections upon the gallery floors or adjacent walls of the building, substantially as described.

Tenth, I claim fastening and unfastening automatically the doors or gates of the galleries or landings, by spring latches or their equivalents, operated by cams or projections upon the car, substantially as described.

Eleventh, I claim the arrester, u′, in combination with the fluid retarder, for the objects and purposes set forth.

Twelfth, I claim passing the shipping rods, and the cord or rod that operates the friction brake through the car or platform, for the objects and purposes set forth.

25,062.—Wm. B. Twiford, of Chincoteauque, Va., for an Improvement in Dumping Wagons:

I claim the three-sided four-wheel, open frame, C, stationary crank axle, B, and long wagon body, D, when constructed and arranged for operating together, in the manner and for the purpose described.

[This invention relates to four-wheel dumping wagons, and is designed to obviate the necessity of using a turning crank axle. The nature of the improvement consists in the combination in a peculiar manner of a stationary crank axle having two short journals, with a wagon body, which is hinged to the frame at a point near the center of its length. By this arrangement an open space is left in the frame beyond the axis on which the body swings, for the hind end of the body to move or descend through when the front end is elevated. This construction is more permanent than a turning crank axle, and is also much simpler and cheaper.]

25,063.—Felix Tylee, of Cleveland, Ohio, for an Improved Spring-bed Bottom:

I claim, first, The central support, C, when the same shall be constructed substantially in the manner and for the purpose set forth and described.

Second, I claim the combination and arrangement of upper slat, D, pin, e, supports, f f, with central support, c, spring, d d, and blocks, a a, when all shall be constructed and arranged in relation to each other as fully set forth and described.

25,064.—Lorenzo Tyler, of Havana, N. Y., for an Improvement in Machinery for Sowing Fertilizers:

I claim the arrangement of the frame, A, hopper, B, partition, N, adjustable slide, M, valve, L, cylinder, H, concave I, adjustable slide, J, and flexible clasps, K, the whole being constructed and operated as and for the purpose set forth.

25,065.—Geo. H. Van Vleck and Horace Tupper, of Buffalo, N. Y., for an Improved Hose Coupling:

We claim the arrangement on the thimble, A′, of the head, C, with two or more screw threads, D, having its upper end turned down, as described, and being provided with a projecting rim, E, to operate in combination with the thimble, A, and with the nut, B, substantially as and for the purpose set forth.

[A simple and efficient hose coupling—that is, one tha can be "set up" quickly and easily, as well when the water is turned on as when it is off, has long been a desideratum. Such a coupling is the object of this invention, which consists in arranging at the ends of the thimbles to which the hose is fastened a male and female screw, with two or more threads, the female part of the screw being placed loosely over one of the thimbles, so that it can be turned independent from the hose and the male part, which is cast out of one piece with the other thimble, and an additional rim that serves as a protection and assists in making the joint tight.]

25,066.—Amsey Warren, of Westport, Conn., for an Improvement in Cultivators.

I claim the parting or deflecting bar, D, hoes or shares, E E′ G, and rake, C, when applied to a suitable frame, A, provided with

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wheels, B, the whole being arranged and combined to operate as and for the purpose set forth.

[By employing a rake, hoe blades, or shares, and a parting or defleeting bar attached to a mounted frame having a handle secured to it, a device is obtained that may be shoved by a man between the rows of crops under cultivation, and the soil pulverized and the weeds eradicated.]

25,067.—J. F. Waterhouse, of Germantown, Pa., for on Improvement in Knitting Machines:

I claim, first, The application of a drum, 5, or its equivalent, with detachable pegs, to ope ate a series of independent thread guides having independent springs, when constructed and operating substantially as set forth and for the purposes specified.

Second, The striker, V, or its equivalent, constr cted and arranged in respect to the thread guides, and operating substantially as specified, so as to control such of the thread guides as are not under the control of any of the pegs in the drum.

Third, Moving the pegged drum, or its equivalent, at intervals first in one direction and then in another, by means of the revolvin disk, 3, and its two inclined projections in combination with the ratchet wheel, 2.

Fourth, Imparting a combined lateral and vertical reciprocating motion to the needle bars by means of the devices described, or their equivalents.

25,068.—J. A. Wilkinson, of Brooklyn, N. Y., for a Machine for Receiving and Piling Paper:

I claim, first, The accelerating bands, p1 p3, and roller, o, arranged and acting as set forth, to project the sheets of paper successively over each other, as they subside in the air, and in combination with the foregoing parts, I claim the endless apron receiving such sheets as specified.

Second, I claim the retarding bands, q and ss and q3, in combination with the delivering bands, p1 p3, for the purposes specified.

25,069.—J. A. Wilkinson, of Brooklyn, N. Y., for an Improvement in Rotary Presses:

I claim first, The curved demi-grab, c, with the sliding clamp 6, and lip, 5, for the purposes as specified.

Second, I claim the curved compositors' shield, C 3, for the purposes specified.

Third, I claim the arrangement of the proof cylinder, B, and rollers c b, for inking the type on the proof cylinder, as described and shown:

Fourth, I claim the plate, a', and roller, b 2, for giving pressure in taking a proof from the types on the cylinder, B, as set forth.

Fifth, I claim the horizontal gudgeon, a3, and binding screw, to secure the proof cylinder, and facilitate the correcting of the types, as set forth.

Sixth, I claim the movable clamping segments, d', at the heads of the type or proof cylinders to secure the types in place, and also allow for the removal of portions thereof, as specified.

Seventh, I claim revolving the type cylinders in a trough containing alkaline or other suitable solution for washing the types as specified.

Eighth, I claim the apron, f, for leading the paper into the press, and on which said paper lies, while receiving the first impression against the cylinder, K, thereby said feeding apron becomes also the tympan sheet, as set forth.

Ninth, I claim a curved arch or bridge, over which the paper or fibrous material passes, to give direction thereto and prevent buckling or twisting, as described and shown.

Tenth, I claim corrugating or forming ribs on said curved bridge in diverging lines, so as to spread the paper widthways, as the same passes over the bridge, as specified.

Eleventh, I claim the auxiliary frame, F, hinged into the main frame, F, and carrying the upper inking apparatus, by the elevating of which both type cylinders are exposed to view or can be lifted out of their place for varying the composition or otherwise, as set forth.

Twelfth, I claim the manner specified of throwing off both impressions by raising the auxiliary fame, F', and lowering the impression roller, K, for the purposes and substantially as described and shown.

Thirteenth, I claim in a rotary printing-press an endless tympan sheet, let off a sufficient distance, and so fitted that the offset from the ink of the first impression does not again reach the paper until removed or sufficiently dry, so as not to produce blurring or offset on the paper, as specified.

Fourteenth, I claim the arrangement of the ink-rollers, l' l'' l''' l'''', in the manner and for the purposes set forth, whereby the rollers, l' l'', act to supply the required amount of ink to the rollers, l''' l'''', that supply and work the ink on the cylinder, I or I', as specified.

Fifteenth, I claim the arrangement of the ink-rollers, l', and workers, k k', in their adjustable bearings, i'' k'', substantially as and for the purposes set forth.

25,070.—Eri Wills, of Augusta, Maine, for an Improvement in Stump-extractors:

I claim the combination of the frame, O O, tongue, P, and shaft, A, with the wheels, R R, ratchet-device, H G I, levers, F F, and chain, B, constructed and arranged in relation to each other as and for the purposes set forth.

25,071.—A. P. Winslow, of Cleveland, Ohio, for an Improvement in Roofs for Railroad Cars:

I claim the plates, D, caps, F, and grooved-rafters, B, when arranged substant ally as set forth for the purpose descriced.

25,072.—J. F. Wisnewski, of Cincinnati, Ohio, for an Improvement in the Preparation of Glycerine:

I claim the employment or use and introduction of the withinnamed chemicals, in the relative quantities, manner and combination described for the purposes set forth.

25,073.—Edward F. Woodward, of Brooklyn, N. Y., for an Improvement in Skeleton-skirts:

I claim the sectional extension skirt, when combined and attached to the circular skirt, the whole being arranged and constructed in the manner and for the purpose set forth.

25,074.—Albert H. Wright, of Camden, N. J., for a Composition of Matter for Ornamental Purposes:

I claim the composition of the matter described, the same consisting of the clay and sulphur with the emery, or its substitute, combined together substantially as and for the purposes described.

25,075.—John K. Wright, of Philadelphia, Pa., for a Machine for Printing in Different Colors:

I claim hanging the rollers used for printing separate colors and patterns on separate frames, D E, and constructing and arranging the said frames so that they may be adjusted independently of each other on the rails, B, as and for the purpose set forth.

25,076.—Nathan Ames, of Saugus, Mass. (assignor to himself and Ward McLean, of New York City), for an Improvement in Revolving Stairs:

I claim, first, Arranging steps or stairs upon an endless belt, or in any manner equivalent, and placing them over rollers, substantially as described, so as to form a revolving flight of stairs, which may be used both as a common flight and as an elevator.

Second, The triangular arrangement of the stairs, as shown substantially in Fig. 3, whereby an endless flight is made to pass around three rollers B D D, for the purpose described.

Third, The double parallel arrangement, as shown substantially in Figs. 1 and 3, whereby ascending and descending flights are placed side by side.

Fourth, The use of auxiliary stationary steps or stairs, to operate in connection with the revolving stairs, substantially as and for the purpose set forth.

Fifth, The employment or use of rods or slots, to operate in connection with the slotted stairs, substantially as described and for the objects specified.

25,077.—L. S. Baldwin and Lucius Parks, of Leroy, N. Y. (assignors to L. S. Baldwin aforesaid), for an Improved Construction of Lightning-rods:

I claim the employment of a quadrangular tube of sheet-metal with spiral-fluted sides, A, in combination with the straight central supporting-rod, B, substantially in the manner and for the purpose set forth.

25,078.—R. Eickemeyer, of Yonkers, N. Y. (assignor to himself and E. Underhill, of same place), for an Improvement in Sewing-machines:

First, I claim the combination of the angular supporting-plate, F, with a needle applied and arranged to work through an opening in the angle of the said plate, and obliquely to both faces of the said plate, substantially as described, for the purpose of sewing obliquely through any subs ance supported in the angle of said plate.

Second, I claim the combination of the angular supporting-plate, the obliquely-arranged needle, and a looper, applied and operating so as in its movements to follow the angle of said plate substantially as described.

Third, I claim the combination of the looper, v w, constructed with a two-pronged hook, and having a triple movement, as described, with a stationary guide, 25, applied and arranged relatively to the needle and the angular supporting-plate, substantially as described.

Fourth, I claim the arrangement of the feeding dog and presser, in a swinging frame, I, so applied, in combination with the angular supporting plate as to provide for the introduction and removal of the hats to and from the machine substantially as described.

Fifth, I claim the slide, fitted as described to the angular plate, F, opposite the feeding dog, with its face recessed behind the general surface of the plate, as shown in Fig. 7, and having applied to it a spring, S, by which it is operated as described, in combination with the feeding dog, for the purpose set forth.

Sixth, I claim the plate, 26, with its lips, 27, 28, applied substantially as described, in combination with the plate F.

25,079.—Asahel Elmer (assignor to Nathan Elmer and R. M. Pritchard), of Shabbona Grove, Ill., for an Improvement in Portable Capstan and Crabs:

I cla m so combining with the truck wheels or ground supports a capstan and crab, and a flexible rigging, as that the power of the team that draws the apparatus and works the capstan may be used for setting or anchoring the said crab and capstan, as well as to raise it up, reload it on to the truck, and transport it from place to place, substantially as described.

25,080.—Isaac Goodspeed, of Norwich, Conn., assignor to himself and Geo. A. Mansfield, of Boston, Mass., for an Improvement in Bomb Lances:

I claim, first, The compound wing described, consisting of the wing proper, a, the lever, f, and the pin and slot at g, the whole being combined, arranged and operated substantially as herein set forth.

Second, I claim the construc on of a projectile having a prismatic shank with guiding wings of copper or any thin substance, fixed to the exterior surfaces of the prism in such a manner as to expand in coincident plates, substantially in the manner and for the purposes set forth.

25,081.—Louis Koch (assignor to himself and H. Forstrick), of New York City, for an Improved Railroad Station Indicator:

I claim the apron or band, K, wit the names of the streets or stations on the line of the route marked thereon, attached to and working on rollers, I I, or a revolving plate, or stationary plate and revolving index, when said apron, plate or index are operated from the running-gear of the car by suitable mechanism to give the same a contin uous movement and simultaneous with that of the car, for the purpose set forth.

25,082.—Morris Pollak (assignor to Morris Talkenan, Morris Pollak and Solomon Weiner), of Hoboken, N. J., for a Double Clasp-hook for Watch-chains, &c.:

I claim the S-shape or double clasp hook formed by the disks, b b, and clasp-jaws, d d, on the center pin, c, that passes through the middle of the bent piece, a, substantially as set forth.

DESIGNS.

Robert Ham (assignor to Smith, Shelden & Co.), of Troy, N. Y., for a Parlor Stove.

E. J. Ney (assignor to the Lowell Manufacturing Co.), of Lowell, Mass., for Carpet Patterns. (Two cases.)

Isaac de Zouche, of St. Louis, Mo., for a Parlor Coal Stove.

N. E. Russell, of New York City, for a Table Fork.

DISCLAIMER.

William Blake, of Boston, Mass., for an Improvement in Gas-burners. Patented Aug. 9, 1845; disclaimer filed Aug. 5, 1859:

I hereby enter my disclaimer to that part of said burner which was set forth and claimed as the "bell shape or mouth of the lower part of the inner case of said burner."

EXTENSION.

William Blake, of Boston, Mass., for an Improvement in Gas-burners. Patent dated Aug. 9, 1845:

I claim the combining with the space, d d, directly beneath the orific s of discharge of the gas, and with the supply or branch tubes, f f, an expansive chamber e e, so as to operate in the manner and for the purpose set forth.

I also claim making the lower part of the inner case of the burner with a bell-shaped opening or mouth, in the manner and for the purpose specified.

ADDITIONAL IMPROVEMENTS.

A. A. Richards, of Urbana, Ohio, for an Improved Lock. Patented Feb. 15, 1859:

I claim the arrangement of the spring, f, collar, a, ring, x, screw, u, brake-wheel, W, and arbor, S, in the manner above described, so as to produce friction between the ring, X, and wheel, W, and arbor, S, and also the arrangement of the brake, k, indented flange, W, and stem, o, as above described, so as to prevent the revolution of the wheel, W, and a bor, and ring, X, and the external dial hand, substantially as described.

Frederick Yeiser, of Lexington, Ky., for an Improvement in Instruments for Taking Altitudes of the Sun. Patented Feb. 8, 1859:

I claim, in combination with the rotary bar, E, the arrangement of the adjustable bar, F, and dial plate, R, and rotary cylinder, H, and adjustable disk, D, in connection with the bar, k, and plates, a a, holding the lens, e e, and having on its face a small square, 3, to receive the sun's image through the lens, in such relation to each other, and to the rotary bar, E, that it operates substantially as and for the p rposes specified.

THIRTY-FIRST ANNUAL FAIR OF THE AMERICAN INSTITUTE, in the City of New York.—The Managers announce that the Exhibition will be opened at Palace Garden, in 14th-street, near the 6th-avenue, on September 21, 1859. New Inventions and Improvements in the Mechanic and Industrial Arts, any articles of superior quality and beauty of workmanship, will be received from Sept. 15 to 20. Steam power will be provided to put in operation all kinds of machinery. Premiums will be awarded on the reports of competent and impartial judges. Circulars can be had at the office of the Institute, in the Coope Institute Building, corner of 8th-street and 4th-avenue. By order of the Managers.

WM. B. LEONARD, Cor. Sec. D. R. JAQUES, Chairman.
JOHN W. CHAMBERS, Rec. Sec. 8 2t*

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Correspondents

G. M., Jr., of Ill.—An electric light, such as you descr be, has been experimented with for a long time in our city, principally in rega d to its application for light-houses. It has not yet been rendered perfectly practicable for this purpose.

S. R., of Mass.—If you run the piston of your engine at a velocity of 300 feet per minute, you will obtain the best results from it, we think. If the water in your boiler is clean, there is no necessity for running it off every three weeks.

G. C. L., of N. Y.—You can dissolve india-rubber in coal-oil, or in warm spirits of turpentine.

E. H., of Del.—You state that the steel tool which you were grinding became quite hot at the end farthest from the stone, and remained cool near the point where it was being ground. If you employed water in grinding, it would carry off some of the heat generated at the point; if not, your hand must have acted as a non-conductor to retain the heat conducted to the end of the tool.

C. H., of La.—We are much obliged to you for the diagrams you send us. We thin , however, they will not afford sufficient general interest to our readers to warrant us in presenting them in our columns. We will send the paper to Mr. Mills; $5 received.

W. P., of Ohio.—It will require a pipe with one square inch of area to be 1,692 feet high, and filled with water, to overcome a press re of 60 lbs. in a boiler. A column of water of this elevation exerts a press re of 61 lbs., nearly, on the square inch.

A. D. B., of Pa.—The molds for smooth brass-castings are made of iron. Chilled iron-castings are also run in iron molds.

J. Z. W., of Vt.—It would be of no use to try to get circulars of all the mowing and reaping-machines ever patented. So far as we know, compressed air has not been used for teleg aphing, except by the use of the piston air-telegraph. The compression, however, was very limited.

M. N., of La.—We have found sweet oil and rotten stone best adapted for cleaning mahogany furniture. It is rubbed on with a piece of flannel first, then finished off by rubbing with an old silk hand erchief.

J. R., of Del.—The bullets for the United States army are made out of solid metal by machinery, but we do no know how many are made per minute by one machine. All the cone bullets that we have seen were molded.

D. K. A., of Ohio.—We are confident that you cannot bleach coal-tar with chlorine, without altering its character in a measure; but you can easily make the experiment, at a very small cost.

L. V. B., of Ky.—Iron water-tanks should all be coated with asphalt varnish, put on hot, and allowed to become perfectly dry before the water is admitted. Common pitch, heated in an iron vessel, and put on quickly with a br sh, will answer your purpose. Cisterns lined with lead should never be used for holding water intended for domestic purposes.

J. G. W., of N. Y.—We have endeavored to account for all explosions by pressure, and the cases to which you have referred us may be so explained. We refer you to the letter of Mr. Washburn, in another column, for confirmation of our views. We should be glad, however, to receive your explanation of the matter.

J. G. C., of Ala.—You will find the description of an ice-house on page 59, Vol. XIV., SCIENTIFIC AMERICAN.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Sat rday, Aug. 13, 1859:—

E. & R., of Mich., $25; J. W., of Ohio, $25; J. R., of La., $20; H. W. W., of ——, $30; A. B., of N. Y., $55; Z. T. C., of Ind., $30; J. A. P., of Ind., $30; F. C. L., of N. Y., $30; A. H., of La., $30; T. T. C., of Texas, $25; P. M. S. & Co., of Texas, $25; H. H. B., of N. J., $25; W. R. S., of N. Y., $25; W. P. C., of Ohio, $25; G. W. R. B., of La., $55; L. R. F., of Ga., $40; M. D. D., of N. Y., $20; G. E. S., of Ill., $30; J. H. S., of N. Y., $55; T. G. W., of N. Y., $32; A. L. C., of N. Y., $30; E. K. B., of N. J., $30; H. K. S., of Mass., $30; B. F. A., of Ky., $30; W. S. M., of Pa., $25; A. K., of Ill., $25; J. W., of Mass., $30; A. C., of Mass., $75; E. M., of Mich., $30; P. & R., of Conn., $30; H. R. K., of Ohio, $10; R. D., of Mich., $25; R. S. L., of Conn., $40; L. T., of ——, $30; J. M. C., of ——, $30; W. M., of Mass., $35; J. N., of ——, $30; C. L. R., of Wis., $50; A. & B., of N. Y., $55; J. B. A., of N. H., $300; S. & J., of Cal., $20; S. B., of Wis., $30; J. L. G. W., of Mich., $15; W. & S., of Cal., $5; G. S. M., of Pa., $25; T. & J., of Pa., $30; C. G. P., of Ohio, $25; T. G. G., of Ill., $25; E. W. D., of Mass., $20.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Aug. 13, 1859:—

J. W., of N. Y.; W. R. S., of N. Y.; J. S., of Ill.; S. & C., of Tex.; J. R., of La.; J. F. H., of N. Y.; A. H., of La.; M. D. D., of N. Y.; T. H. & H. W. S. C., of Texas; H. H. B., of N. J.; J. L. G. W., of Mich.; C. L. K., of Pa.; T. G. W., of N. Y.; J. S., of Ohio; A. M., of N. Y.; J. W. P., of N. Y.; E. M., of Mich.; A. C. M., of Vt.; W. M., of Maine; W. & S., of Cal.; R. D., of Mich.; G. S. M., of Pa.; K. V., of Mass.; S. L. O., of Conn.; H. G. T., of Mass.; E. J. H., of Pa.; A. E. & S. N. McC., of aine.

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CALIFORNIA AGENCY FOR PATENTS.—WETHERED & TIFFANY, San Francisco, will attend to the sale of patent rights for the Pacific coast. References:—Messrs. Tiffany & Co., New York; Wethered, Brothers, Baltimore; George W. Bond & Co., Boston. 4 13

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Munn & Co.,
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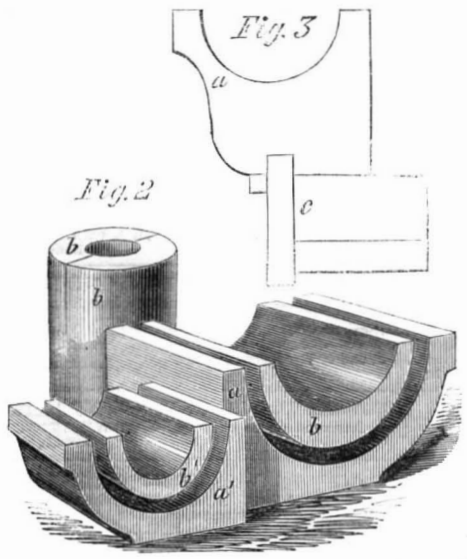
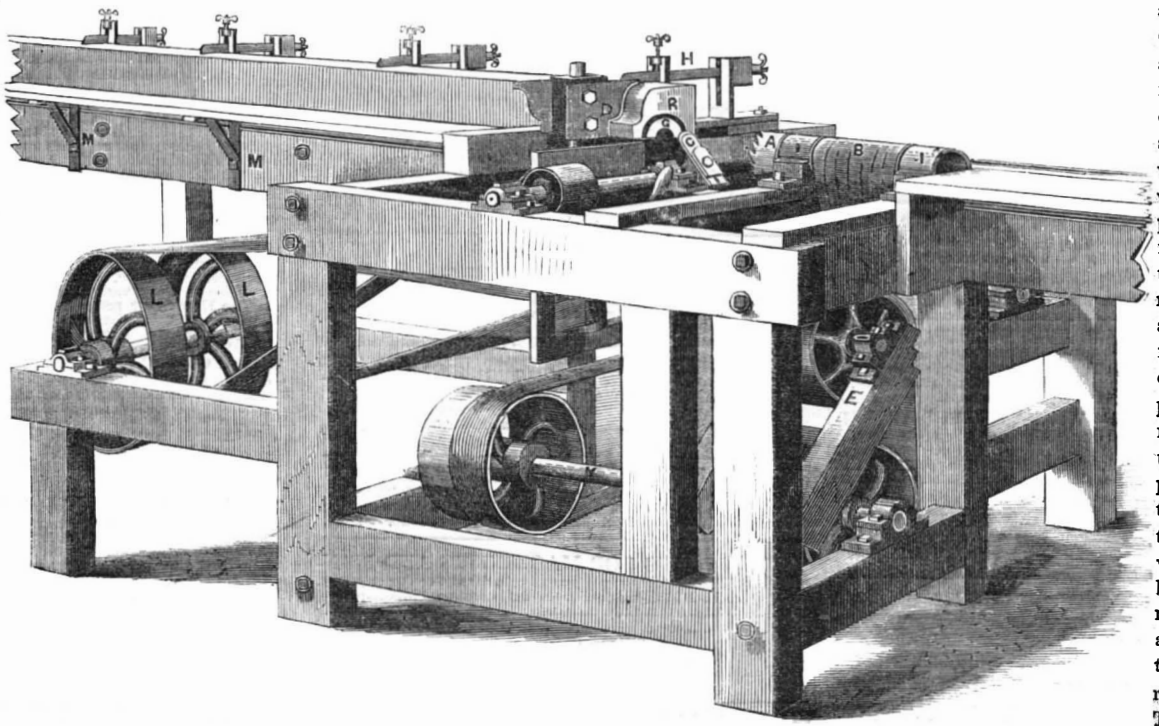
FIELD'S MACHINE FOR CUTTING WOODEN GUTTERS.

The subject of our illustration is for producing wooden gutters with great economy of lumber, two gutters being got from one piece of wood, and with great rapidity and neatness. It was patented Feb. 1, 1859, by the inventor, Samuel T. Field, of Worcester, Mass., and its chief novelty lies in the arrangement of the saw and a rotating cutter. The saw, A, is cylindrical, and it is rotated by a belt, B, passing over it, its bearings I, being flush with its surface, and they offer no obstruction to the passage of the gutter over the saw after it has been cut and as it is fed along. A rotating cutter, C, cuts out he groove to make the inner gutter, G, and the saw, A, passes around it and cuts it from the stick, and at the same time makes the larger gutter, R; and a vertical cutter, D, rotated by a belt from L, shapes one side of it so that it is suitable for the exterior of a house, and with the skeleton, *c*, Fig. 3, enables it to form a cornice. The stick moves between guides, H, on the table, M, and the rotating cutter is moved by a belt from the wheel, L. Fig. 2 shows the gutters ready for use, *a* and *a'* being the largest gutters, and *b* and *b'* the smaller ones, placed as they come from the saw; *b*, is of a slightly different shape, internally, from *b'*, each being best adapted for certain purposes. Conductors for carrying water down the sides of buildings, or to be used for drain-pipes, can be made by nailing two segments, *b*, together, and when protected by tar or paint will last a great length of time. The saw mandrel is rotated from the shaft, V, and a tightening pulley is placed on the frame, E, to keep the belt, B, at the proper tension.



These eve-troughs, gutters and conductors can be made of every size necessary for all kinds of buildings; when made from good spruce or pine are very enduring; they have the advantage over the ordinary ones in that their interiors are regular, and they give no opportunity for the water to lodge and prematurely rot the wood. The vertical cutter, D, can be removed, and both sides of the eave-trough left perfectly vertical, without any ornament or shaping off. The inventor has the machine in use, and makes a great number of all its various productions, and those persons who feel interested in the invention can obtain any further information upon addressing Messrs. Holt, Field & Bros., Worcester, Mass.



NEW MACHINE FOR CUTTING WOODEN GUTTERS.

THE SO-CALLED ALIZARIN INK.

Every one who knows alizarin, the red coloring principle of dyer's madder, will expect a red ink to which the name of alizarin ink is applied, and he cannot fail to be astonished to find it, instead of a red, of a dark green color, and the writings with it soon change to dark blue and black. The above name, therefore, is a mystification, invented to conceal its ingredients and mode of preparation, and to mislead an attempted analysis. No doubt many have tried in vain to prepare such an article as it has appeared in commerce a short time since, from madder, but obtained an entirely different product.

The author has made an analysis of alizarin ink of commerce, and found it to consist of ordinary nutgall ink, with an admixture of crude wood vinegar and solution of indigo. He gives the following formula for preparing such an ink, which, in all its properties, is identical with the commercial article:—

One hundred parts of powdered nutgalls are digested with twelve hundred parts, by weight, of crude wood vinegar at a moderate heat for several days, then transferred to a filter, and washed with crude vinegar until the filtrate weighs twelve hundred parts. In this clear brown liquor, twelve parts of green vitriol and fifty parts of gum arabic are dissolved, this solution, under frequent agitation, set aside for several days, and at last so much solution of indigo added to make the whole fifteen hundred parts, when immediately the ink assumes that peculiar dark preen tint. The solution of indigo was made by dissolving one part of indigo in four parts of Nordhausen oil of vitriol, diluting with water, precipitating with carbonate of potassa, filtering and washing the precipitate with water. When the sulphate of potassa is nearly washed away, the blue precipitate commences to dissolve; and this solution of the precipitate—the so-called indigo-carmine—was used.—*Wittenstein's Vierteljahrsschrift.*

SCIENCE AND ITS VOTARIES.—The following is an extract from the Springfield, (Mass.) *Republican*; we endorse every idea in it:—"We have listened to the reading of some of the papers presented to the Scientific Association, and examined the published abstracts of others, with the view of ascertaining their absolute value to the world of practical life. We presume that our opinion will coincide with that of the association itself, on the point of public utility. Much of the knowledge conveyed is simply curious. Much is only interesting to scientific men. Fanciful theorizing swells the aggregate of that which the public cannot appropriate with profit, while only here and there do we find a fact, or a thought, which has a vital value to the world of practical life. Now, while we would be the last to bring scientific investigation and revelation to the rigid test of utility, in every effort and essay, it seems reasonable that, generally, and in the main drift, they should aim at popular ministry and service. There is very little significance to any effort of man unless it relates to life—to the discovery of the divine thought and the divine mode of life and manifestation, or the life of men. Science, purused for the sake of science, is as ridiculous as making newspapers for the sake of newspapers, or frying sausages for the sake of the sausages." A good comparison.

QUARTZ MILL.—G. T. and W. F. Kearsing, of Butte City, Cal., have invented an improved quartz mill in which the step of the vertical driving shaft is sufficiently elevated to be out of the way of sand, and capable of being easily reached for lubricating purposes. The runner can be raised and lowered without making it necessary to disconnect any of the parts except the removing of one pin, the runner being suspended from arms extending in a horizontal direction from the vertical driving shaft by means of rods furnished with screws and nuts so that by turning the nuts the runner is elevated.—The patent was granted July 26, 1859.

PROGRESS OF INVENTION.—There are ninety-one patents whose claims are published in our columns this week. Of this number thirty-five are issued to the clients of MESSRS. MUNN & CO., Editors and Proprietors of the SCIENTIFIC AMERICAN, this city; this is more than one-third of the whole issue, and indicates not only the extent of their business but also the great confidence reposed in them by the inventors of the country.

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